CHNOLOGY DEPARTMENT

Gas Journal

Vol. 254. 100th Year. LONDON, APRIL 7, 1948. No. 4427. Price 1/-

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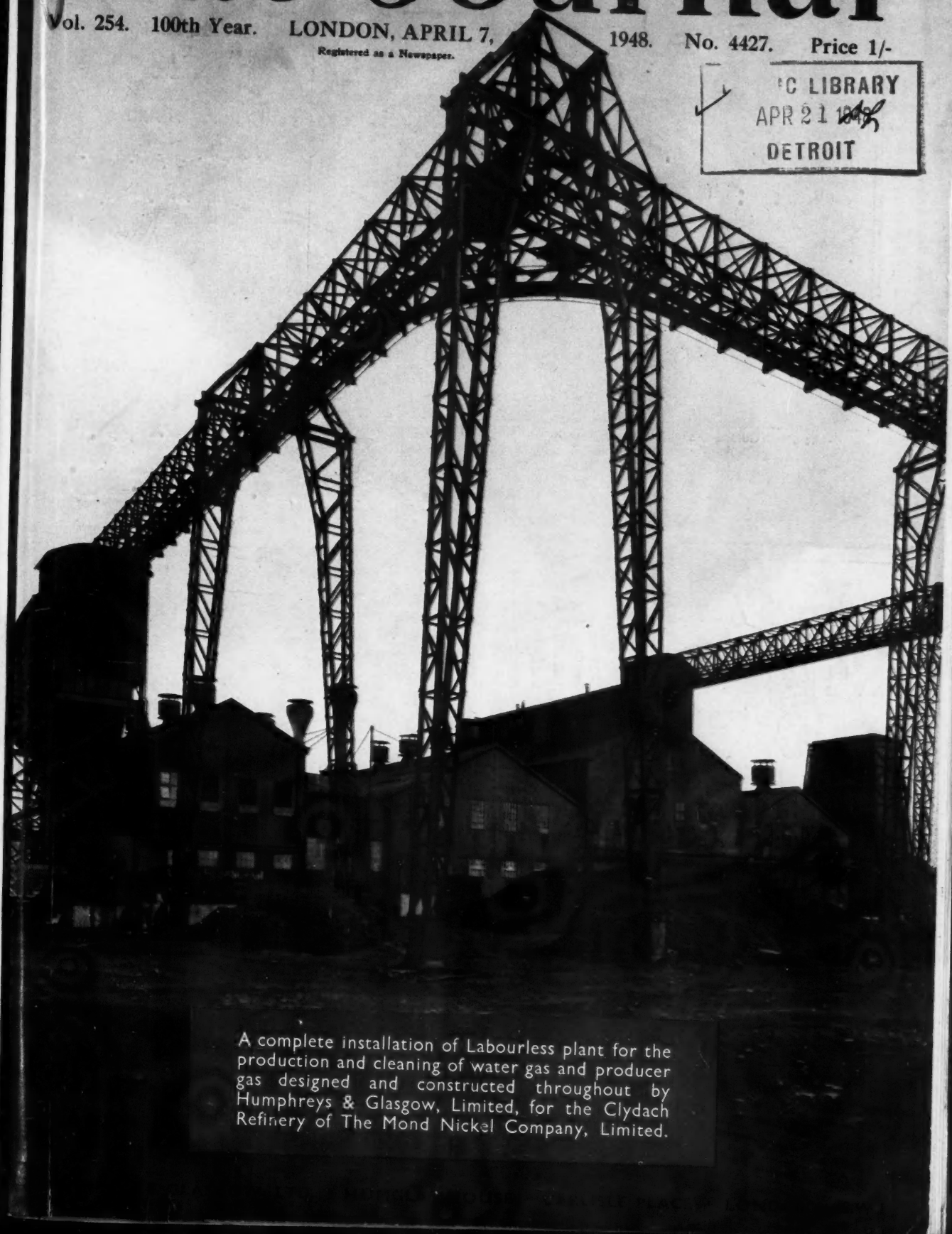

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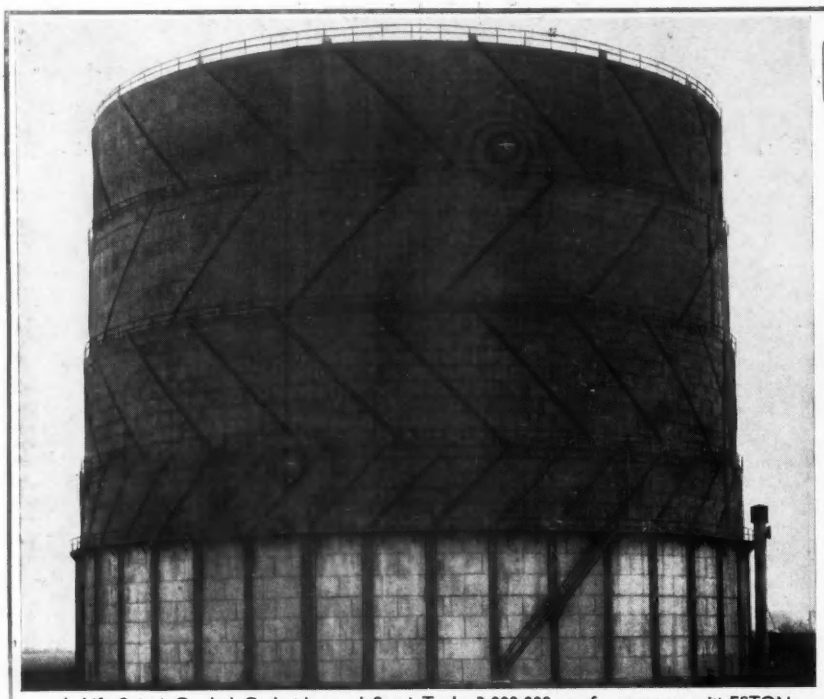

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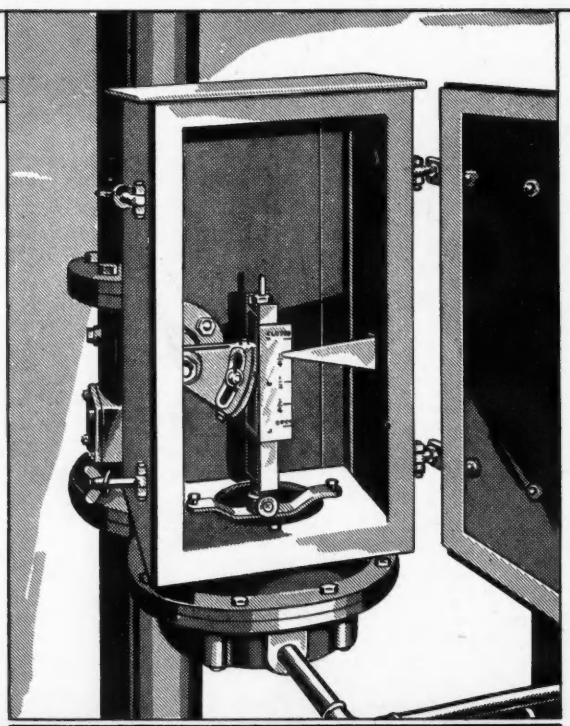

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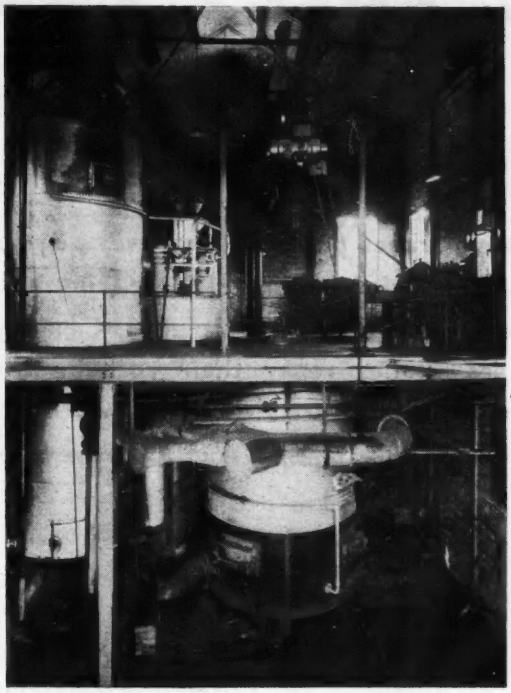

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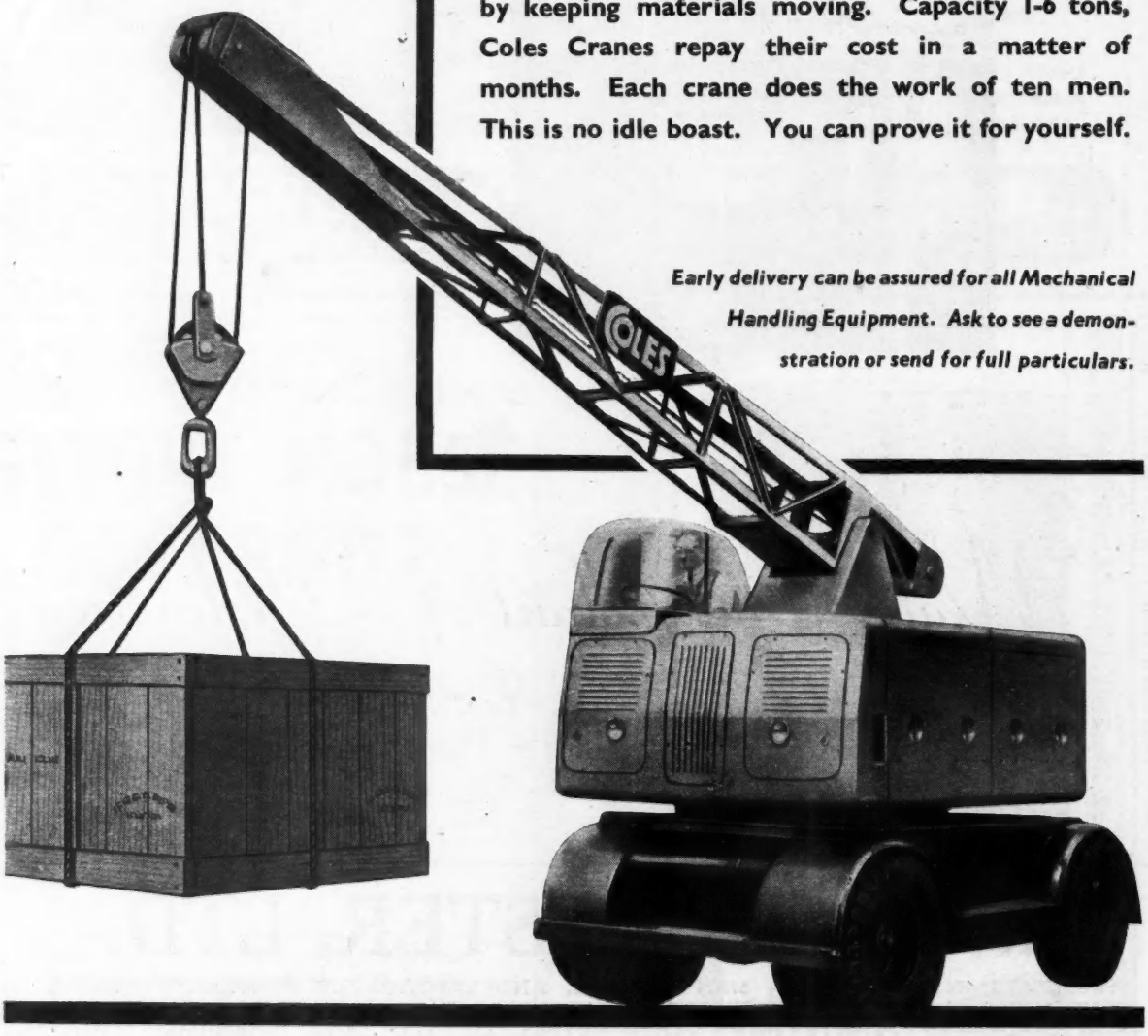

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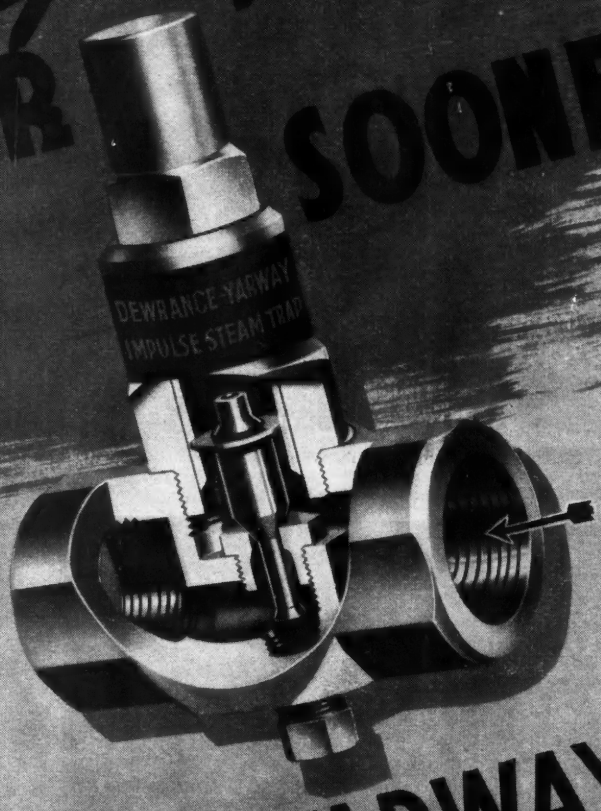

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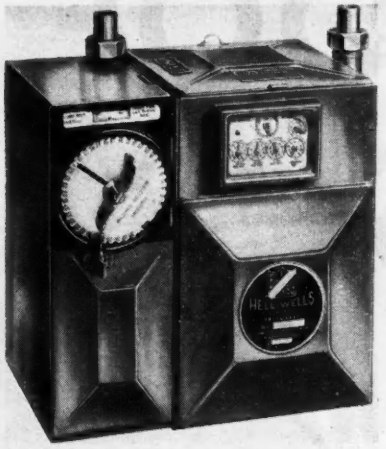

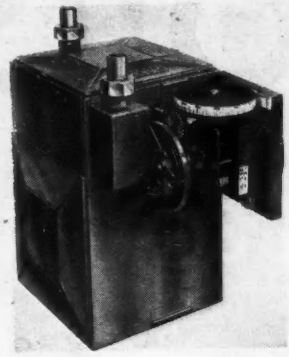

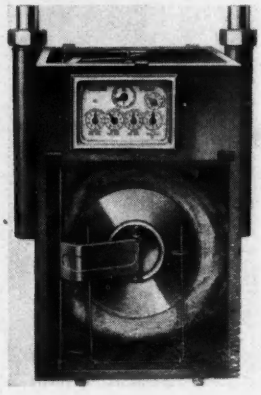

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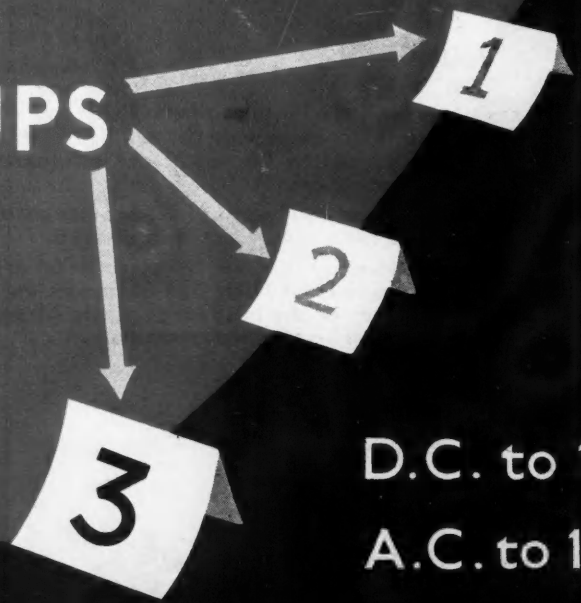

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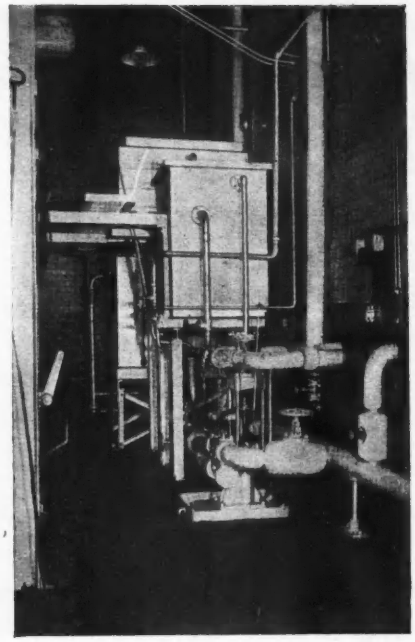

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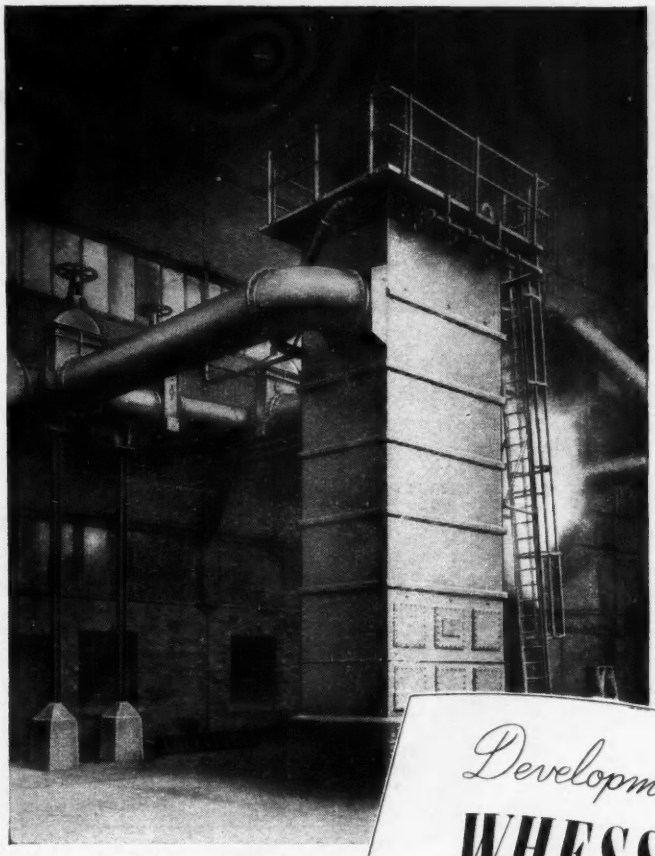

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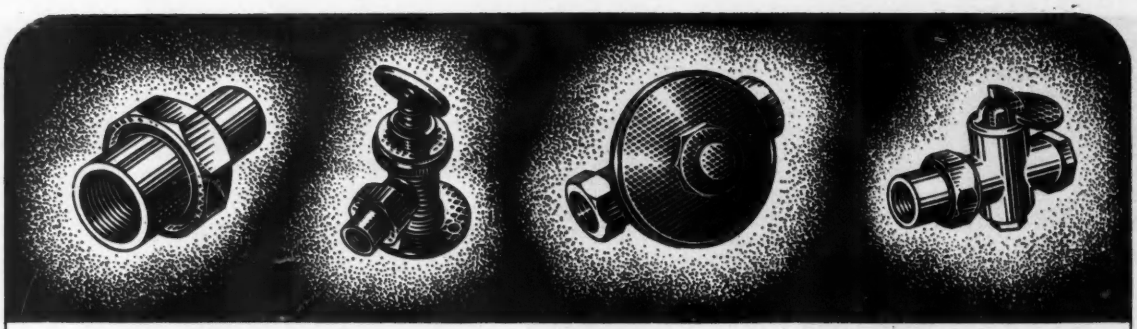

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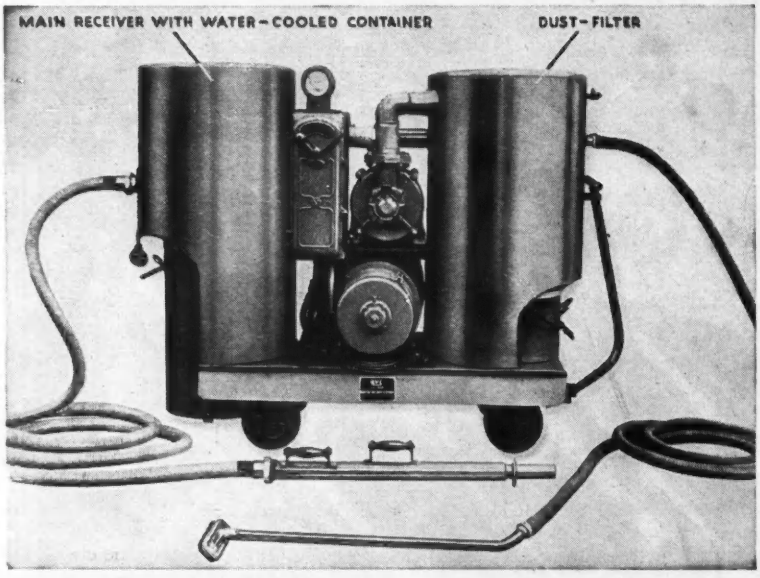

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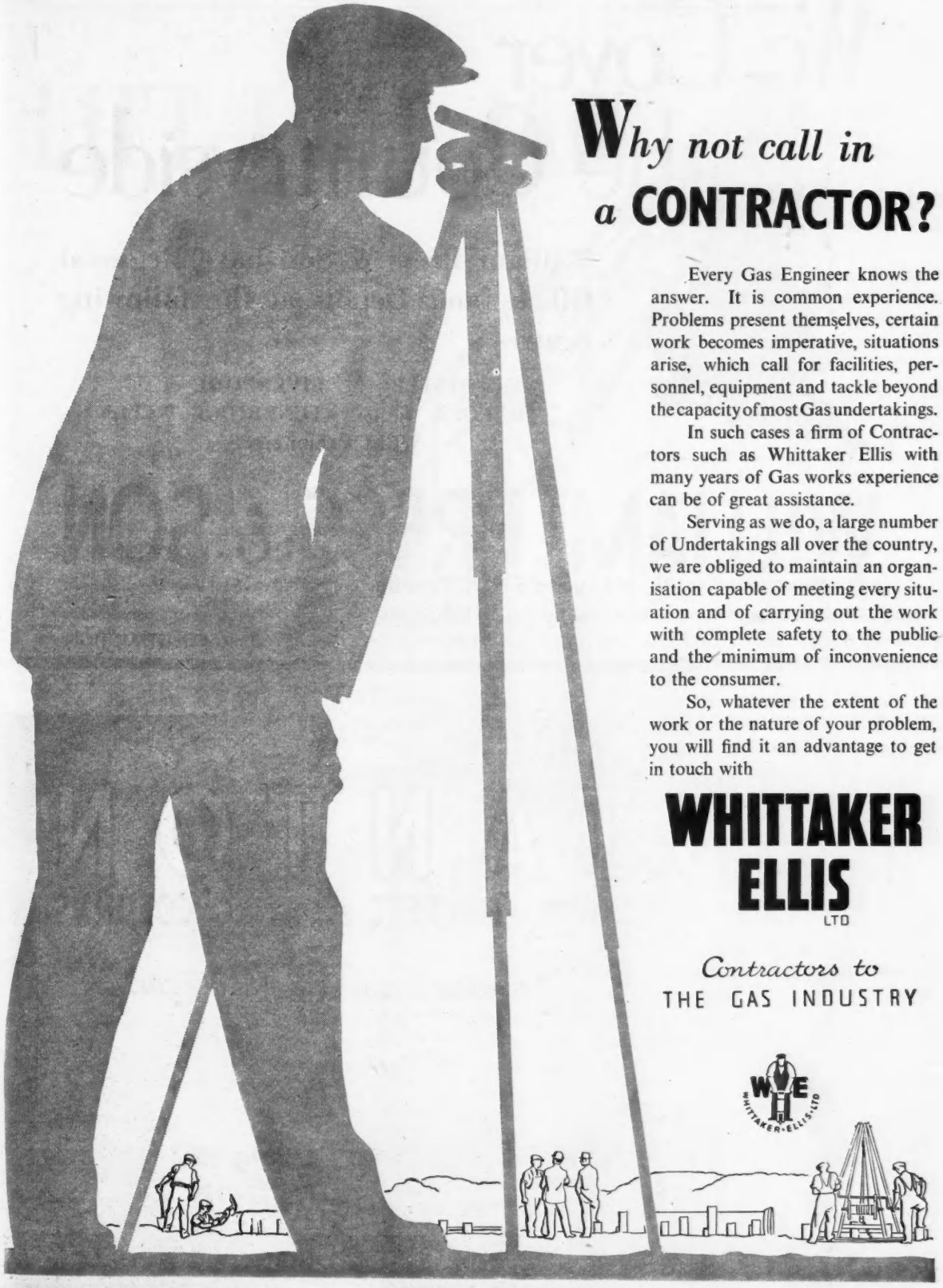

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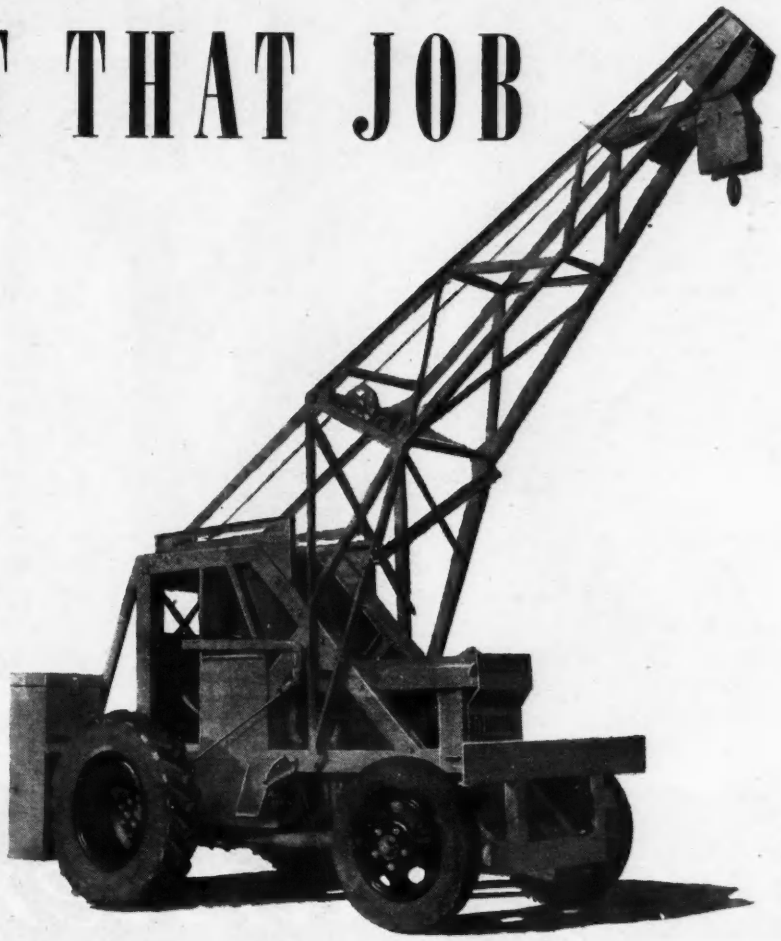

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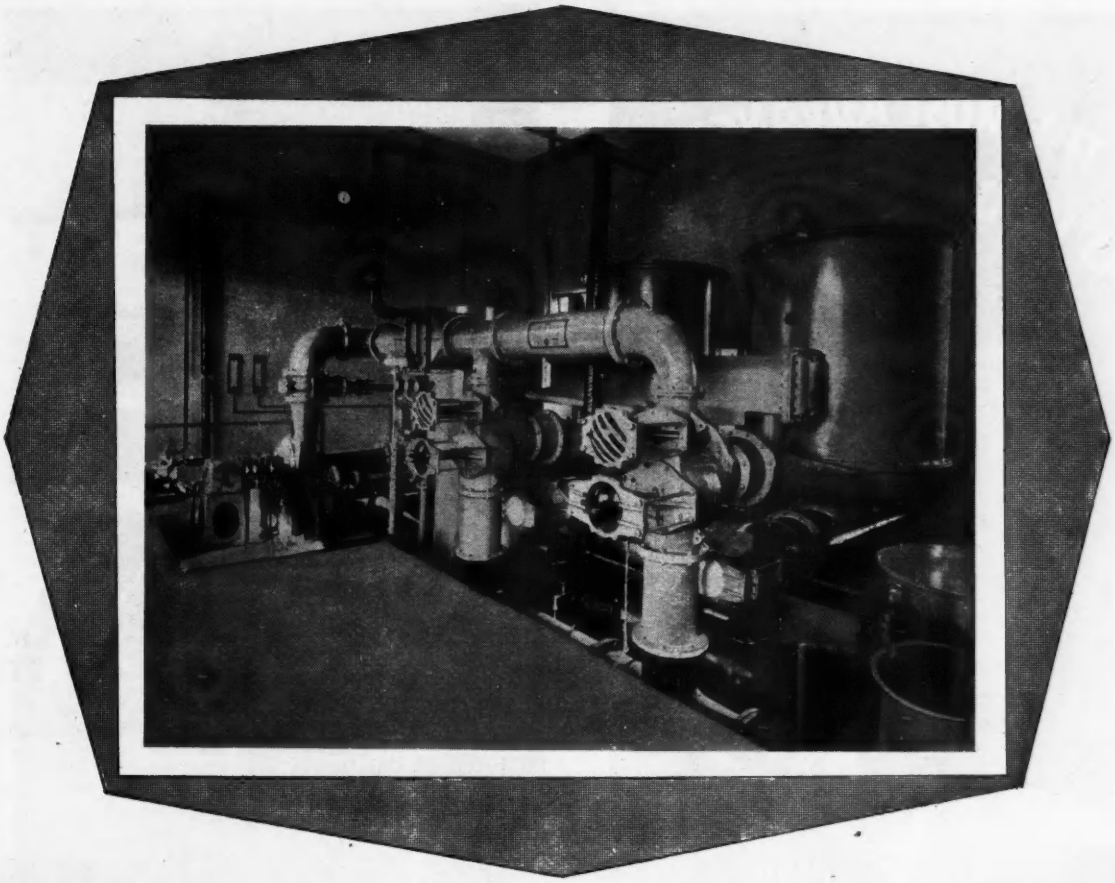

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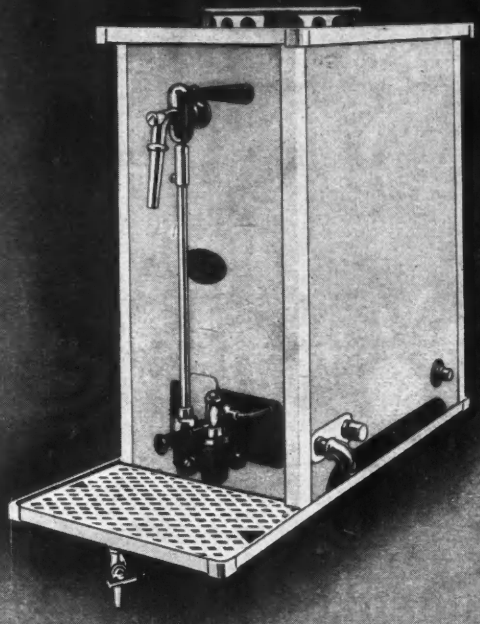

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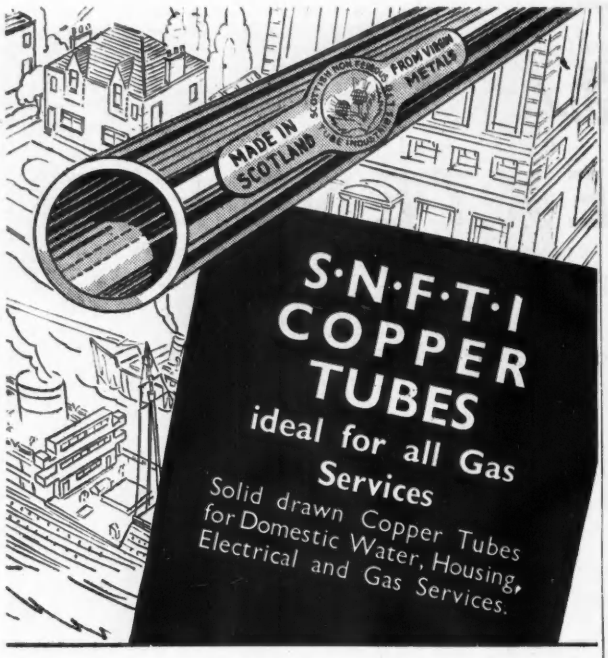
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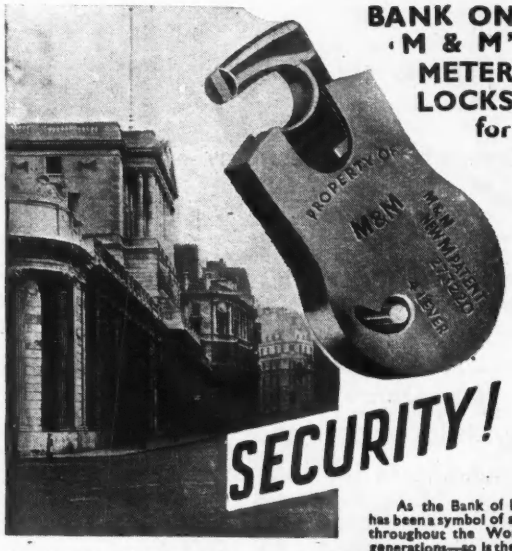

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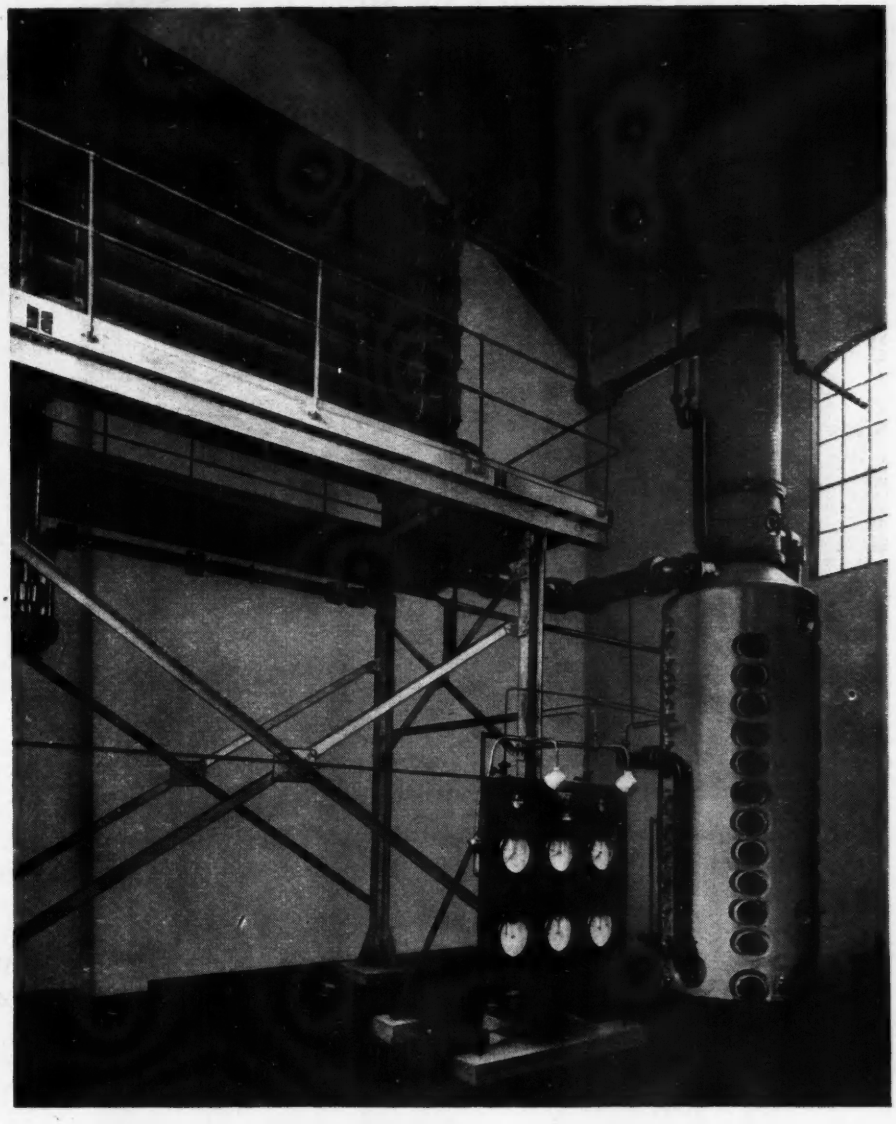

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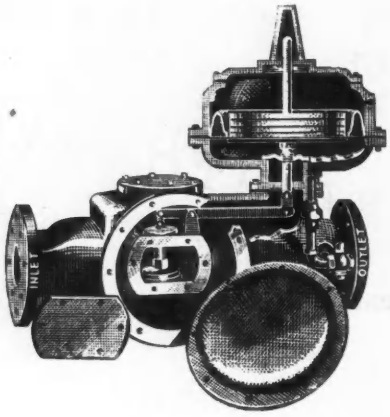

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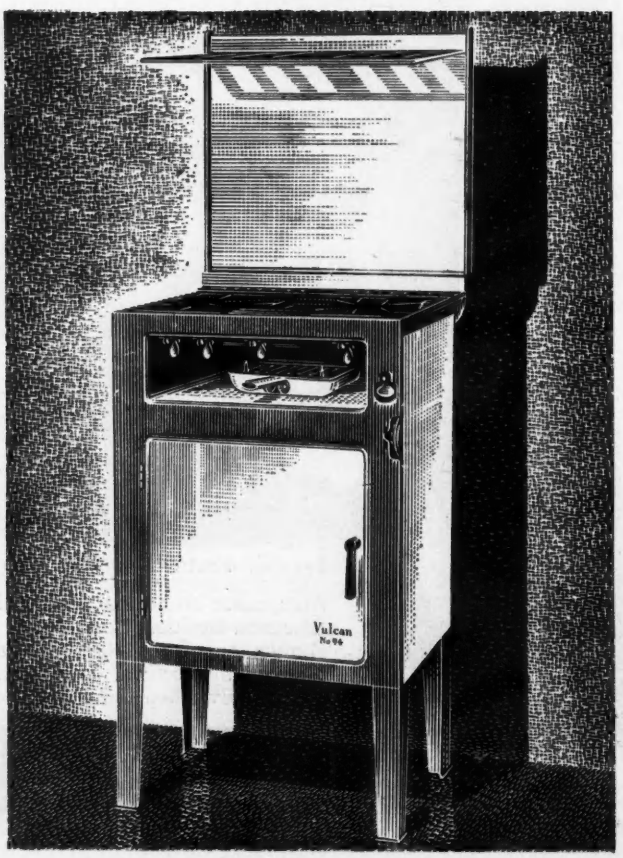

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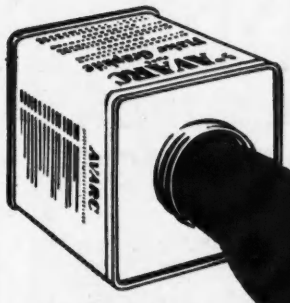

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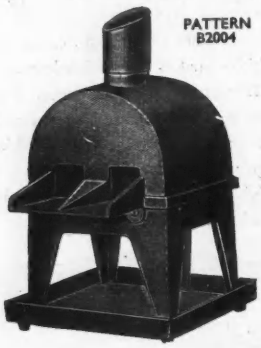

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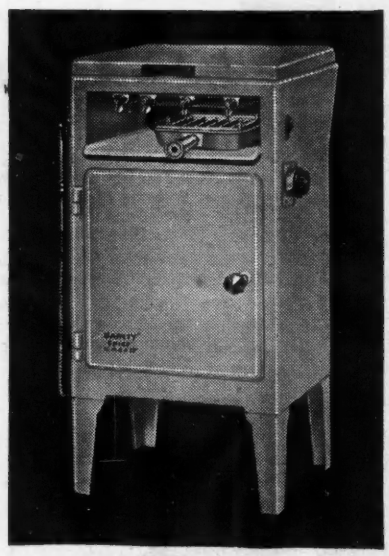

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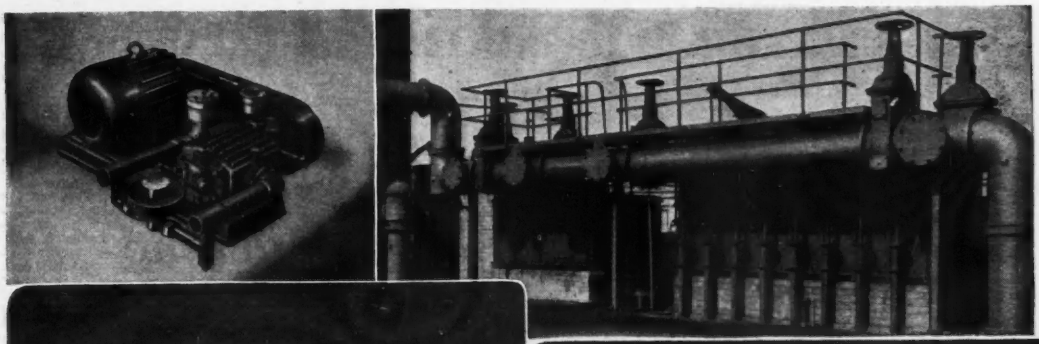

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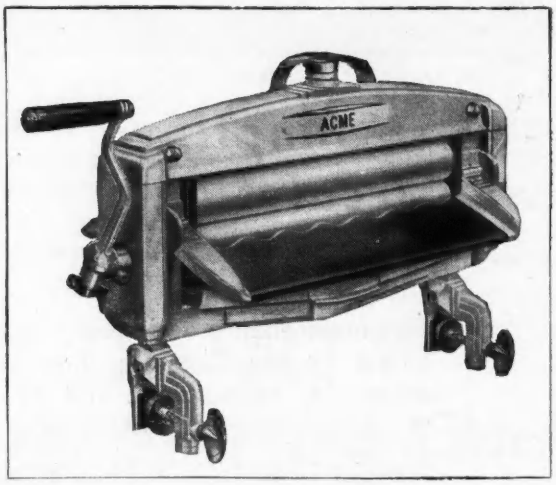

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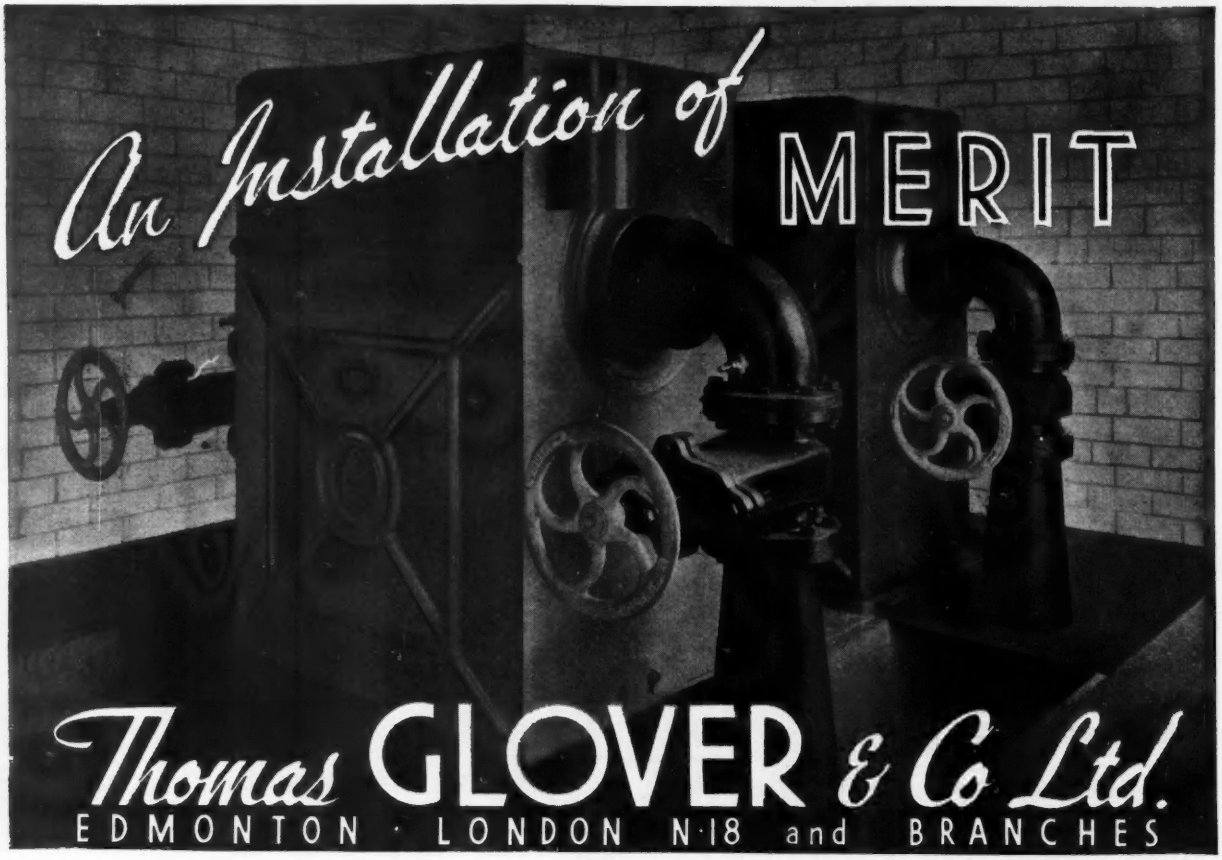

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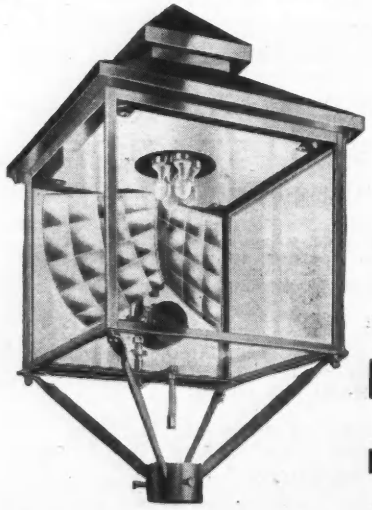

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GAS JOURNAL

Vol. 254 April 7, 1948 No. 4427

HOUSE WARMING

HOUSE warming in Britain has developed to a point which is interesting and may be significant. Dr. Harold Hartley, President of the Institution of Gas Engineers, speaking recently to the Manchester and District Junior Association of Gas Engineers—his address will be published in full in "GAS"—described the miserably inadequate heating of Britain's homes prior to the war. Apparently, he said, it takes a world cataclysm to bring to effect a decisive improvement in these conditions. The millions in the lower income groups lived in houses constructed by builders who knew little and cared less about the principles of economic heating and ventilating. In one room of the house was installed the cheapest possible piece of apparatus which would burn coal and served to cook and to heat some water. There were fireplaces, cheaper still, in other rooms, even in the bedrooms, but these were seldom used. In later years a gas fire of the smallest dimensions might be placed in the "parlour." But for the most part in the coldest part of the year the family huddled round the kitchen range and the rest of the house was miserably cold. The bedrooms were not even warm enough to remove the dampness from blankets and clothes.

In the 35 heating weeks of the year three tons of coal were burned, yielding 180 useful therms with an efficiency of 20%. The Ministry of Labour investigated a selected number of dwellings occupied by industrial workers and found that an average of 6s. 5d. per week was spent on fuel. Five changes of air per hour were considered necessary to secure adequate ventilation and the first effect of lighting a fire under a flue much too large was to reduce the temperature of the room by drawing in unnecessary volumes of cold air. And the state of things in the homes of the professional classes was not (for the most part) much better. It had never occurred to architects or builders to arrange the house round the heating arrangements, and although there were fireplaces or gas or electric heaters in most rooms reliance was placed solely on radiation. With most of these appliances arranged in the outside walls of the house the fuel efficiency was very low. Dr. Margaret Fishenden had shown that unless the air temperature was at least 45° F. it was impossible to secure comfortable conditions by high temperature radiation. This was particularly evident when the number of air changes was excessive. Dr. Hartley's view is that air changes can be reduced to 1½ to 2 per hour and that the air itself should be warmed to 55° or even 60° F.

The interesting and significant point is that in the large number of houses built in the post-war housing programmes and occupied for the most part by the lower income groups the heating unit is placed in the middle of the building, and in many hot gases are circulated more or less effectively through the walls and floors of the upper rooms. The "council house" is really better heated than the houses of the quite high income groups. Heat losses are reduced by the still somewhat rudimentary insulation which when developed should effect a cut of 40% in fuel consumption. The reduction in the rate of air change should make a further cut of 20%.

The ideal system, it is clear, for this country at any rate, is a combination of air heating—background heating to 55° or 60° F.—with topping-up as required by high-temperature radiant heat. And whole-house heating is necessary to complete satisfaction. It is intolerable that the occupiers should not be able to sit and write or read in comfort in every part of the house. The attainment of this standard would make an enormous improvement in the conditions of home life. And the facts and figures which Dr. Hartley gave show that it is technically and economically possible to attain this standard. He explored the several ways in which it can be done. The communal (district) heating system has the defects, first that it needs the addition of topping-up, creating a demand with such a poor load factor that neither gas nor electricity can carry it economically, and second that it eliminates freedom of choice; all houses in the district must take the supply whether they want it or not. Individual systems are the subject of several promising experiments from which we should very soon be getting reliable data. And finally there is the idea of the heat pump. Of late, much attention has been given to this idea, suggested originally by Lord Kelvin about three-quarters of a century ago. Owing to the availability of cheap coal it had not been advocated seriously as a source of heat until the last few years when the need for fuel economy has brought it to the fore. Hitherto the heat pump has been used chiefly for large scale heating purposes, the outstanding example in Europe being at Zurich, but the possibility of applying the system to the ordinary small house is worthy of consideration, and developments along these lines are known to be taking place in the U.S.A. Dr. Hartley outlined the attractions of the heat pump as: Each unit of mechanical energy supplied to the pump can be made to deliver between three and four times as much equivalent thermal energy; in addition to heating the home in winter, the heat pump can be adapted for cooling it in summer. With the heat pump a suitable medium is circulated so as to enable low grade heat to be absorbed from a source such as the earth; the amount of low grade heat obtained being three or more times as much as the energy used as work in driving the compressor. The compression of the circulating medium raises its temperature and the higher potential energy thus obtained is used for warming the house or other building. The cycle is completed by bringing the medium back to its original condition and in this way there has been dissipated perhaps four units of high temperature heat for each equivalent of energy absorbed in the pump. To obtain the low grade heat which is required in considerable quantity, pipes can be buried in the ground below frost level so that they drain off heat from the earth—this is the method suggested for domestic heat pumps in the U.S.A. In summer, instead of drawing low grade heat from tap or river water or the

earth, the heat in the house may be used as the low grade source to warm the circulating medium. The house air is thereby cooled and in fact the same machine is being used either as a heat pump or as a refrigerator.

Dr. Hartley concluded with two important statements. In the first place the country cannot contemplate large scale changes in house warming practice involving an overall increase in the consumption of coal. On the other hand there is every chance that in the next few years we shall have developed means of improving our heating standards very considerably without increasing the quantity of coal used.

GLOUCESTER-DURSLEY LINK

THERE was more than met the eye in the inauguration of the bulk supply of gas from Gloucester to Dursley on Wednesday of last week. Primarily it was a case of a large undertaking coming to the aid of a small one that was faced with a demand far exceeding its existing capacity. In more normal times the smaller undertaking might have contemplated extending its plant or even building a new works, but it took the more practicable course of seeking a bulk supply from a big neighbour. Had they both been in the same holding company the link would probably have attracted less attention, but although both Dursley and Gloucester are members of holding companies they are in different groups, and the negotiations were therefore on a new level, with a unit of the South Western Gas and Water Corporation acquiring a bulk supply from a unit of the Severn Valley Gas Corporation.

The completion of the link within a space of 22 months from the first approach is a noteworthy achievement, especially bearing in mind the antiquated legislation under which the parties had to operate. No less satisfactory has been the speed and efficiency with which the actual work has been accomplished. Started in October and finished early in March, the contract involved all sorts of problems of shortage of labour and material, with necessary provision for proposed road widening and other possibilities. The new main adds another link in a remarkable chain of connected undertakings in the proposed South Western Area, covering, as the General Manager of the South Western Gas and Water Corporation pointed out at the luncheon, a mains system nearly 250 miles in total length. When, as is contemplated in the Gas Bill now in Committee stage, the new South Western Area Gas Board takes over, it will find that the industry in that part of the country has already achieved voluntarily what some people regard as incapable of being accomplished except under some form of compulsion. The inaugural ceremony and the luncheon that followed represented a happy combination of county, city, and countryside interests, all acknowledging the high efficiency of the service rendered, in that part of the country exclusively, by private enterprise.

PROGRESS AT STOURBRIDGE

THE story of Stourbridge is that of a very large number of undertakings which are of a capacity capable of availing themselves of most of the modern developments of manufacture but still not too great to be outside the constant personal supervision of the chief executive officer. In cases where the engineer is properly supported by his governing body these undertakings achieve a technical efficiency which is not exceeded by any of the larger units. It is to be hoped that the new Area Boards, when they come into being, will not overlook this fact when they have regard to the organization of the management groups in their regions.

The story was outlined by Mr. S. J. D. Williams in his Presidential Address to the Midland Association of Gas Engineers and Managers, published in the "JOURNAL" last week. Starting with horizontal retorts which were modern in 1893, these were supplemented by water gas plant in 1912 and 1915, while a beginning was made with the continuous vertical retort in 1921. In 1930 the installation of eight more verticals enabled the horizontals to be dispensed with, and in 1935 a third instalment of verticals of the new upwardly heated type brought the carbonization plant up to a capacity which with water gas has been sufficient to cope with the rapidly growing demand. Wise foresight and careful maintenance has enabled the undertaking to cope with an unprecedented situation with confidence.

The purifying plant, wet and dry, is equally modern and efficient. But we fear that Mr. Williams' question whether we are now in sight of a really reliable wet purifier which will work automatically and do away with the unpleasant work of emptying and recharging oxide boxes cannot yet be answered in a decided affirmative. One such process is being worked on a considerable scale and we understand that while there are still some problems to be solved these are now about to be tackled in earnest. In the meantime one wonders whether something could not be done to apply the principles of the tower purifier on a smaller scale than existing installations of that type, at any rate in the direction of arranging the oxide in cases which could be lifted out and renewed apart from the main boxes.

Stourbridge experienced the same sort of development between 1939 and 1945 as most other undertakings in industrial areas, no doubt largely due to the shortages of solid fuel, but it is interesting to learn that 75% of the industrial demand comes from the glass industry, one of the main industries in the district being the manufacture of crystal glass. Gas does not yet, however, appear to be able to compete with other fuels for bulk glass melting, although we believe that it is successful in other districts. In the finer work and in many other heat consuming processes its many collateral advantages have secured its success. In the domestic field the prepayment consumer is taking 123 therms per annum as against 68 in 1938, while ordinary meters have risen from 134 to 190 therms per annum. Industrial gas has nearly doubled.

Mr. Williams made the usual observations about the dearth of suitable recruits for the technical staff and he put his finger on the reason so often stated—that the salaries offered are not yet proportionate to the cost of training and the responsibilities to be assumed. Housing difficulties, with their cramping effect on mobility, are another factor militating against the free movement and training of the younger grades. Finally he touched on the tremendous problem which faces the industry in coping with the maintenance of existing plant and the extensions required to keep up with a still rapidly growing demand, even though a mild winter has made it less spectacular than it appeared to be a year ago. We wish Mr. Williams a successful year of office, knowing that the Midland Association will continue to make its contribution to the development of the science of gas manufacture.

ELECTRICITY NATIONALIZED

The electricity supply industry, and with it a number of composite gas and electricity companies who had elected to hand over entirely rather than retain only the gas portion of their undertakings, came under State ownership on April 1, the vesting day appointed under the Electricity Act, 1947. Compensation values fixed by agreement between stockholders' representatives of electricity supply companies and the Minister of Fuel and Power were announced on the eve of vesting day and on the whole the stockholders' representatives appear to have secured a better bargain than holders received who had to accept compensation values fixed by reference to the Stock Exchange Daily Official List.

It was officially announced on Thursday that British Electricity stock issued to holders of electricity securities on the vesting of the undertakings would bear interest at 3%, would be redeemable in 1968-1973, and would be made at par. The new stock differs from British Transport stock in that the maturing bracket is only five years instead of ten years, and the life of the new stock is 20-25 years compared with the 30-40 years for the Transport issue. Another announcement on vesting day was that prices for bulk electricity supplies to be charged by the British Electricity Authority to the Area Boards had been fixed for an interim period

only, expected to last a year. Charges to consumers will be based on these prices when the Area Boards have decided on the principles on which their tariffs will be based. Mr. A. Robens, Parliamentary Secretary to the Minister of Fuel and Power, issued a warning that supply would not overtake peak demand until 1951, and Lord Citrine, Chairman of the British Electricity Authority, said the Government were anxious that prices generally should be kept down and they wanted to avoid all-round increases if possible, but he gave a warning, echoed by several Area chiefs, of a possible increase in electricity charges. The British Electricity Authority held a vesting day reception at the Savoy Hotel, Lord Citrine receiving about 300 guests, including Mr. Hugh Gaitskell, Minister of Fuel and Power, Mr. Robens, principal officers of the Ministry, professional institutions, and others connected with the industry.

COPPER PIPES UNDERGROUND

"Copper Underground: Its Resistance to Soil Corrosion," is an excellent publication. Superseding a previous booklet, "The Resistance of Copper to Soil Corrosion," this new Copper Development Association publication contains much more extensive data, acquired by means of field tests, and further records of practical experience, made available since the issue of the earlier booklet. The effect of the new with the old information is to provide striking testimony as to the superior resistance of copper to soil corrosion. "In the great majority of soils," the new booklet states, "copper has an almost unlimited life, while in some of these soils other materials commonly employed are eaten through in a few years. Copper pipes need protection only in a few exceptional types of soils, in which pipes of other materials would be at least as liable to attack." Commenting on the field tests carried out by the British Non-Ferrous Metals Research Association on copper and lead and by the U.S. National Bureau of Standards on copper, lead, steel, and cast iron, the publication shows that copper proved to be the most satisfactory material. Evidence of resistance to corrosion in service in this country of copper pipes underground includes the fact that it is nearly 22 years since experiments were first carried out by the Nairn Gas Light Company, with such satisfactory results that copper has been adopted locally for all gas services employing ¾ in. to 2 in. diameter light gauge tubing. No internal or external corrosion trouble has been experienced. Various services have been opened at intervals; test pieces have been cut out and found to be as good as when they were laid. In 1936 the Newcastle-on-Tyne and Gateshead Gas Company installed several copper service pipes. In 1942, three of these, at widely separated points in Newcastle and Gateshead, were unearthed for inspection. The summary of the report on these pipes, said: "Six years in clay and clean soil have had but little effect on the copper service pipes, and a life of many times this period could be expected. No pitting has taken place, and no reduction in wall thickness at any one particular place is to be found. The system of jointing appears to be excellent, and, although in only one case had cover boards been placed over the pipes, no mechanical damage had occurred." In 1947, a copper service pipe was unearthed at each of the same three points, and short lengths were cut out for examination. Two of these were from original pipes laid in 1936 and not since disturbed. The other was from the length of pipe inserted in 1942 to replace the length cut out. These samples showed that there had not been any appreciable alteration in their condition since the preceding examination in 1942. The new booklet is available to those interested from the Copper Development Association, Kendals Hall, Radlett, Herts.

OPERATION INDUSTRIAL

To watch the steady and direct progress towards a set objective of a band of consultative experts is a source of satisfaction. This thought is occasioned by recent study of a booklet describing the activities of the Yorkshire Industrial Gas Centre, Ltd., which is achieving its purpose in no uncertain fashion. We have followed the activities of this body of research workers since the Centre's formation in 1934 with great interest, and perusal of *A Record of Service and Achievement* has convinced us, if any reassurance was necessary, that our respect was warranted and that the title of this record is well chosen. The object of the Centre was and is the development of the industrial and commercial gas load. This it has achieved by the collation and dissemination of pertinent technical information, by making available industrial demonstration equipment installed at the works of the two largest member undertakings of the Centre, and the monthly meetings of technical representatives of the 56 member undertakings for discussion and exchange of information. Later, the Centre carried out research work in collaboration with the Department of Fuel and Metallurgy of Leeds University, and undertook the construction of equipment for specialized applications and investigation on the district. Particular mention must be made of the education scheme organized by the Centre, mainly for the benefit of students of the Fuel Department of Leeds University. The previous booklet under review describes briefly a number of the installations carried out under the guidance of the Centre, and the notes give some indication of the remarkably wide field covered, involving not only the more normal commercial heating problems and treatment of metals, paint drying, &c., but exploration of the less common plastics and brewing industries. Of the latter the booklet states: "A very large potential field ready for tapping (*sic.*) offers itself in the brewing industry, and an indication of the possibilities here will be gauged from the fact that one brewery alone in the area of the Centre uses 130 million cu.ft. per annum for the purposes of malt and barley drying, and malt roasting." Here, then, is "food" for thought, and this is but one instance of the way in which gas usage is being widened and improved in the area of the Yorkshire Centre, a body which not only knows where it is going, but has, to no small extent, arrived.

NEW WORLD

In our columns during the advent of the New World Cooker in 1923, we suggested that the New World was a notable advance in gas utilization. The years have gone by and the New World has advanced. The name has high prestige value throughout the gas industry of Great Britain and also overseas. This prestige has been a result of careful workmanship, good design, backed by a research organization of ever-increasing value. It will be noted that we have not quoted New World. The reason for this is that it is a household word and the appliance is used in most homes in the country. A Silver Jubilee is an important event in the lives of many people and also in the life of a gas cooker. To the imaginative it is not difficult to visualize how much the New World has meant in cooking value to the millions of users throughout the past quarter of a century. Radiation Ltd., the manufacturers of the appliance, have demonstrated that a gas cooker can produce good cooking; the functional value of the New World has been proved. The name of the appliance, significant in 1923, stands, even more significant in 1948.

Letter to the Editor

Material Handling

DEAR SIR,—During the discussion on Mr. J. D. C. Woodall's interesting paper "Material Handling on a Provincial Gas-Works," it is reported in your issue of March 24 that the author mentioned, apropos mechanical producers, "that he had heard that Messrs. Gibbons Bros. were contemplating putting in, for the Watford and St. Albans Gas Company, an installation of horizontal chambers with external producers, but the Ministry of Fuel and Power had turned the proposal down and they were having to have built-in producers after all."

I am not aware of the source of this information, but I would like to point out that it is quite incorrect. No application was made to the Ministry of Fuel and Power by my Company and there was, therefore, no question of the proposal being turned down.

Yours faithfully,

T. C. BATTERSBY,
Director,
General Manager, and Chief Engineer.

The Watford & St. Albans Gas Company,
Radiant House, Clarendon Road,
Watford.
March 25, 1948.

The Spring Meeting of the North British Association of Gas Managers will be held at the Lesser City Hall, Perth, on April 9, at 11 a.m. On the previous day there will be a golf competition for the Winson Scott Cup over the King's Course, Gleneagles. Preliminary notice has also been given of the 87th annual meeting of the Association which it is hoped to hold at Aberdeen on Sept. 9.

Personal

Mr. B. E. WILSON, of the Bristol Gas Company, has been appointed Junior Technical Assistant to the Loughborough Corporation Gas Department.

* * *

Mr. GEORGE ARMSTRONG, Coal and Coke Manager on Newcastle Quayside for the Consett Iron Co., Ltd., has retired after 46 years with the firm.

* * *

The degree of D.Sc. is to be conferred on Mr. N. E. RAMBUSH, General Manager of the Power Gas Corporation, Stockton-on-Tees, by Durham University. The award will be made on May 29.

* * *

Mrs. W. M. BUCHANAN, Organizing Secretary of the Women's Gas Council, is touring Scotland during this month, when she will address several women's organizations on the work and activities of the Women's Gas Council.

* * *

Mr. R. B. GARSIDE, Engineer and Manager of the Caernarvon Corporation Gas Department, has been appointed to the post of Engineer and Manager to the Thornton Cleveleys Gas Department. Mr. Garside served his articles with the Engineer and Manager of the Morecambe and Heysham Corporation Gas Department and later held appointments with the Grantham, Keighley, Spalding, and Kendal Gas Undertakings.

* * *

Mr. L. P. INGRAM, Engineer and General Manager of the Taunton and District Gas Company, will take over the additional duties of Engineer and General Manager of the Wellington (Somerset) Gas Company. Mr. HERBERT TREDWIN, who for many years has been Mr. Thomas' Assistant, has been appointed Resident Manager. The secretarial duties will be taken over by Mr. C. V. TILNEY, who is also Secretary of the Taunton and District Gas Company.

* * *

Owing to ill-health Mr. H. H. HOLLIS has resigned his position as Chairman and Joint Managing Director of the Oxley Engineering Co., Ltd., but retains his seat on the Board. Mr. S. STANSFIELD has been appointed Managing Director and General Manager in his stead. Mr. H. SAVILLE has been appointed Chairman of the Company. Mr. A. H. JOHNSON, O.B.E., has resigned his seat on the Board, owing to pressure of business, and Mr. N. DRYDEN has been elected to the Board.

* * *

Mr. K. L. CLARK has been appointed London Manager of W. J. Jenkins & Co., Ltd., of Retford. Mr. Clark joined the Company in February, 1946, shortly after his demobilization. He had served throughout the war firstly in the Somerset Yeomanry and later in the Royal Engineers, in which his final appointment was that of Staff Officer to the Chief Engineer, Berlin, when he was the British representative on the three power Control of Gas, Electricity, Water, and Sewage. Prior to the war, he held the position of Chief Chemist and Deputy Works Superintendent of the Weston-super-Mare Gas Company, and for many years he was Hon. Secretary to the Western Junior Gas Association.

* * *

After 50 years' service in the gas industry, Mr. ALFRED THOMAS will retire next month from the position of Engineer, Manager, and Secretary of the Wellington (Somerset) Gas Company. Mr. Thomas was trained under his late grandfather, Engineer and Manager of the Cowes (Isle of Wight) Gas Company. He was then appointed to a technical position with the Plymouth and Stonehouse Gas Light and Coke Company under the late Mr. P. S. Hoyte, and in 1910 secured the position of Engineer and Manager of the Budleigh Salterton Gas Company. In 1918 he was appointed Engineer and Manager of the Burnham-on-Sea Gas Company, and in 1926 he succeeded his father, the late Mr. Phillip Thomas, at Wellington. During his service at Wellington the output of gas has grown from 48 million to 63 million cu.ft. per annum, and many developments have taken place on both the works and the district. At the annual general meeting held at Exeter on Mar. 23 Mr. Thomas was elected a Director of the Wellington (Somerset) Gas Company in recognition of his long and valued service. He was Chairman of the South-Western District of the Southern Association of Gas Engineers and Managers in 1933.

Obituary

The death has occurred of Mr. DAVID GIBB, who for many years represented R. & A. Main, Ltd., in the north-west of England, and later was Sales Manager on their northern ground, with headquarters at Falkirk. Mr. Gibb had over 50 years' service with the firm.

* * *

The death occurred on Mar. 26 of Mr. H. H. FORSTER, who was Chief Clerk-Cashier in the Rental Department of the Sunderland Gas Company and had been with the Company more than 40 years. Mr. Forster, who was 61, was on his honeymoon at Harrogate at the time of his death. His first wife died a year ago.

News in Brief

A Meeting of the Institute of Fuel will be held on April 21, at 2.30 p.m., at the Institution of Mechanical Engineers, at which a paper will be presented by Dr. D. T. A. Townend, D.I.C., entitled "Recent Developments in Combustion."

Stockton-on-Tees Corporation has received sanction to borrow £301,800 in connexion with additions to the vertical retorts at the Corporation Gas-works and £26,880 in connexion with the provision of mechanical producers for the carbonizing plant.

Copyright Publications GRB22 and GRB23 of the Gas Research Board, dealing respectively with "The Underground Gasification of Coal" and "An Outline of the Theory, Types, and Applications of Combustion Turbines," which were originally published as confidential Information Cirulars, have now been liberated for general publication.

A Considerable Programme of Extensions has been approved in principle by the Motherwell and Wishaw Corporation for the burgh gas-works. The plans involve addition of a kitchen, canteen, and washing facilities, general stores, workshops, and additional offices, lecture, and waiting rooms, garage, and motor repair shop. Mr. W. Kirk, Engineer and Manager, has been instructed to prepare the necessary schedules and general working drawings and to submit these in due course.

Reference Was Made to gas supplies locally and the gas needs of new industries at a meeting of the Tees Industrial Development Board. Mr. A. T. S. Zealley, Chairman, said there was room for apprehension so far as gas was concerned. Schemes were being prepared but there was little likelihood of their being carried out. Mr. Preston Kitchen said that technical experts had submitted plans to the Ministry of Fuel and Power which would ensure ample gas supplies for Tees-side and Cleveland, but they had no knowledge as to what would be the Ministry's attitude.

Long Service Certificates and Badges have been presented to 36 employees of Wm. Whitehouse & Co., Ltd., manufacturers of gas fittings, of Empire Works, Brueton Street, Birmingham, who have between them a record of 1,211 years of service. The two Directors are Mr. G. E. Gamble, who has been with the Company for 53 years, and Mr. F. G. Turner, with 42 years' service, and of the 70 employees nearly 60 have worked with the Company for 10 years and upwards Six of the recipients of long service decorations have been employed for more than 50 years.

Fifty-two Members of the outdoor staff of the Sheffield and District Gas Company attended the final lecture of the winter series in the Company's cinema, Commercial Street. The lecturer was Mr. D. M Holloway, B.Sc., Development Superintendent of the Parkinson Stove Co., Ltd., and as his subject was "The Renown Cooker and the No. 230 Circulator." Mr. Holloway illustrated his talk with a series of lantern slides explaining the features and construction of the appliances. A vote of thanks to Mr. Holloway was proposed by Alderman C. W. Gascoigne and seconded by Mr. S. Cutts.

Next Year marks the centenary of street lighting by gas at Southport, and a small sub-committee of the Corporation has been appointed to find the best way to celebrate the event. "Impending nationalization is all the more reason why we should have the celebration this year, and not next year," said the Chairman, Councillor Wm. Tattersall, who, with Councillor E. O. Hall and Mr. H. J. Risby, Gas Engineer and Manager, form the committee. Costly illuminations are ruled out because of expense and limitations on lighting. It is thought the Association of Public Lighting Engineers may have some suggestions to make.

Recordings Were Made by the B.B.C. at the Gearies Secondary School, Gants Hill, Ilford, on Mar. 16, when the Gas Light and Coke Company gave a film show to the school. The recording took in part of the sound track of the Canadian film, "Life on the Western Marshes," which followed a general introduction by Miss Nina Epton, of the B.B.C., as to the location of the school and the Company itself The school choir sang and the Headmistress (Miss Hobbs) gave a brief history of the school. Unexpected Canadian colour came up when one of the girls gave a message to her relatives in Canada; another girl is off soon to join her father; and one of the teachers gave reminiscences of the year she spent teaching Canadian children in Vancouver (B.C.) in 1938.

A "Service of Daily Houseworkers" is to be run by the National Institute of Houseworkers (the Government-sponsored organization set up to improve the status and training of domestic workers). The first London branch of "Daily Houseworkers" will be opened in the premises of the Gas Light and Coke Company, Horseferry Road. It is hoped that similar branches will ultimately be set up in many parts of the country. All "Daily Houseworkers" will hold the diploma of the National Institute of Houseworkers, and will receive its standard wages and working conditions. They will operate as a pool of daily workers, directly employed by the Institute, and sent out to work in local households for a fixed number of hours. It is believed they will meet the demand of many homes requiring part-time service. Housewives will be able to engage them for one or more hours daily according to their individual requirements.

PARLIAMENTARY NOTES

by "Abaris"

THE House adjourned for the Easter Recess on Mar. 25 and reassembled yesterday. The middle of March produced the usual crop of questions and answers, one of which dealt with scrap steel, the supply of which metal had improved in recent weeks. The Minister of Supply added that the longer term view was still serious, and he had decided to appoint a committee of three members drawn from outside Government Departments and from outside the steel industry. Sir Graham Cunningham, Controller-General of Munitions Production during the war, is Chairman, and the committee would begin work at once.

Requisitioning powers were aired yet again when one of the Members for Brighton asked the Minister of Works what powers of requisitioning had been delegated to the Electricity Boards by his Ministry; and also in what circumstances could the Electricity Board request the Minister of Works to requisition property. Mr. Key said that he had not delegated such powers to the Electricity Board, but "it is open to the Central Electricity Authority, through the Ministry of Fuel and Power, to ask my Ministry to help in the provision of accommodation. It would be for me to decide how I met the request." A moment later Mr. Key said that he had delegated no powers of requisitioning to Electricity Boards and at once a Conservative Member asked him if that reply meant that he, the Minister, could use Government authority to requisition property for the British Electricity Authority. Mr. Key explained that he had not said so, but in exceptional circumstances it might be possible to do so. "The answer means yes," said Mr. Boyd-Carpenter, Member for Kingston-on-Thames.

Area Electricity Boards

The Labour Member for Lowestoft asked the Minister of Fuel and Power how many persons appointed to Area Electricity Boards had had practical experience as workpeople engaged in the supply industry. Mr. Gaitskell, in a written reply, stated that the Electricity Act, 1947, provides that appointments to those posts shall be made by the Minister, after consultation with the Central Authority, from among persons appearing to the Minister to be qualified as having had experience of electricity supply, local government, industrial, commercial, financial, or agricultural matters, applied science, administration, or the organization of workers. Mr. Gaitskell went on to point out that nearly all the chairmen and deputy chairmen and a fair proportion of part-time members had had long experience in the electricity supply industry, or in work closely associated with it; one or more members of each Board had had experience in the organization of workers. He could not say how many of the members appointed had actually been workpeople in the industry.

On the same day the Minister of Fuel and Power told a questioner that he could not undertake to keep the price of fuel oil at the present level, because the inland price depended on world prices.

The Member for Barkston Ash asked Mr. Gaitskell what number of coal cutting machines and what number of conveyors were used in our mines during 1947, and how those numbers compare with 1946. The Minister said that the information was not yet available for 1947, but for the week ended Dec. 14, 1946, the figures were: coal cutters 7,376, conveyors 10,966. For the corresponding period of 1945 comparable figures were 7,121 and 9,658.

The Member for Newark wanted to know if the Minister would remove the control which prohibited a person from changing his or her coal merchant. Mr. Gaitskell replied that the removal of that control was constantly being considered, but that it was not practicable to do away with it yet.

Domestic Coal Allocation

The domestic coal allocation came up when a Member asked the Minister of Fuel and Power if he would arrange for the fuel allocations to be increased in the summer period to enable consumers to build up reserve stocks over against the winter. Mr. Gaitskell, in a written reply, stated: "I will bear the Hon. Member's suggestion in mind in fixing the house coal allocation for the summer of 1948, but the Hon. Member will appreciate that not all domestic consumers have facilities for stocking coal."

On Mar. 16 the Member for Sutton Coldfield asked the Chancellor of the Exchequer if he would give an assurance that the Treasury's estimate of the value of British Electricity Stock for purposes of compensation would, contrary to the precedent of British Transport Stock, be based upon arithmetical calculations. Sir Stafford Cripps replied: No, Sir, "the terms of British Electricity Stock will be decided in conformity with Sections 20 and 25 of the Electricity Act, 1947." The enquiring Member then asked if it would not have been fairer to stockholders if a little arithmetic had been used by the Treasury. Again the Chancellor said, No, Sir.

A Member asked for the reason for the planned increase in civilian oil imports in 1948, compared with 1947, as shown in the Economic Survey for 1948. Mr. Robens, replying on behalf of the Minister of Fuel and Power, in a written answer, said that it was due partly to increased industrial consumption and partly to the need to safeguard civilian stocks.

Cost of Government Advertising

Captain Gammans asked the Financial Secretary to the Treasury what were the total amounts spent in 1938 and 1947 on Government advertising, and received the following figures in a written reply:

	1938 (thousands)	1947 (estimated)
	£	£
Press and posters ...	257	2,948
Films	38	616
Other	164	811
Totals	459	4,375

Sir Waldron Smithers, who asked how many brickworks had been closed down since Jan. 1, 1947, was informed that 53 had closed down. During the same period 77 brickworks had been opened.

Domestic Electricity Load

The domestic electricity load was dealt with in a written reply to the Member for Aston, who wanted to know whether the Minister of Fuel and Power proposed to take any further action to spread the domestic and non-industrial load next winter. Mr. Gaitskell said that he proposed to take further action because the load in question had either remained stable during peak hours or, in some areas, increased. He had appointed a Committee under the Chairmanship of Sir Andrew Clow with the following terms of reference: "To examine and report within the next three months on:

(a) The practicability of installing any instrument by means of which maximum demand and consumption at different times of the day by domestic and non-industrial consumers may be measured and controlled, and

(b) the possibility of securing a reduction of the peak demand on the electricity supply system either by the use of any such instruments or by alterations in the tariff for domestic or non-industrial consumers or by a combination of these methods."

There are nine members of this Committee, one of whom is Mrs. G. R. Lewin, of the Women's Voluntary Service. Mr. E. J. Taylor, who is described as of the Trades Union Congress, is another member.

Our photograph shows Mr. H. H. Brown, Engineer and General Manager of the Exeter Gaslight and Coke Company, presenting past Chairmen's Badges for the South-Western District Gas Salesmen's Circle to Mr. W. T. Lane, Torquay and Paignton Gas Company (Session 1938-39 and 1944-45), Mr. A. Marshall, Plymouth and Stonehouse Gas Light and Coke Company (Session 1945-46), and Mr. F. J. Moore, Taunton and District Gas Company (Session 1946-47). The presentations were made at the March meeting of Gas Salesmen in the newly constructed Demonstration Theatre of the Exeter Gaslight and Coke Company.

INAUGURATION OF THE GLOUCESTER-DURSLEY LINK-UP

THE bulk supply of gas from Gloucester to Dursley was formally inaugurated on Mar. 31, when a senior member of the Gloucestershire County Council unlocked the valve house, and the Mayor of Gloucester and the Chairman of the Dursley Rural District Council simultaneously opened the valves to allow gas to pass into the Dursley section of the main. The ceremony marked the successful conclusion of a scheme first proposed 22 months ago, when the Dursley Gas Light and Coke Company was faced with the problem of obtaining additional gas supplies to meet present and potential demands. The supply position ruled out the possibility of extending the Dursley works, and so the South Western Gas and Water Corporation, in conjunction with the Ministry of Fuel and Power, approached the Severn Valley Gas Corporation with a view to a bulk supply. It was agreed that the supply should be taken from the Gloucester Gas Light Company's 8 in. high pressure main to the Stroud undertaking at Hardwicke, approximately six miles from the Gloucester-Dursley boundary.

Work on the main was commenced at the beginning of October and completed early in March. The length of main in the Gloucester area is 4.5 miles of 8 in. with Stanton-Wilson joints and 1.5 miles of 6 in. with Staveley bolt type joints. The line of main follows the proposed Leeds-Exeter trunk road, via the villages of Moreton Valence, Whitminster and Claypits to the statutory boundaries of the Gloucester and Dursley Companies at Wicksters Bridge. The average depth of the main is 2 ft. 6 in. below the existing road level, but in one section, to provide for proposed road widening, the maximum depth is 6 ft.; valves were inserted at approximately one mile intervals, and the number of syphons amounts to 16. Connexions were left to provide for future extensions at Whitminster, to the villages of Frampton, Fretherne, Saul and Framilode, which are situated within the Gloucester Company's statutory area of supply, and to the village of Eastington in the area of the Stroud undertaking.

The main was tested in four sections to an air-pressure of 49 lb. per sq. in. and no pressure drop was recorded during the following 24 hours. A final test on the whole section, with similar pressure, was carried out satisfactorily. The Dursley undertaking laid 0.75 miles of 8 in. main, with screwed gland joints, from the village of Cambridge to link up with the Gloucester main at Wicksters Bridge, where the meter house is erected. This house was constructed by Messrs. Grange and Son, of Dursley and accommodates a high pressure governor and a Holmes B.M. meter with a capacity of 20,000 cu.ft. per hour, with pressure, volume, temperature, and time recorder manufactured by Bristol's Instrument Co., Ltd.

Gas is transmitted into the Dursley holders via the existing main system, consumers en route being supplied through H.P. district governors. The governors were supplied by E. E. Jeavons and Co., of Tipton. The present agreement provides for a maximum of 300,000 cu.ft. per day. The contractors engaged were William Press and Son, of Westminster, who executed the contract, notwithstanding many difficulties, with entire satisfaction.

Praise for the Contractors

As a preface to the brief ceremony at the new meter house, Sir **Leslie Boyce, K.B.E.,** Chairman of the Gloucester Gas Light Company, said it was a great pleasure jointly with Mr. F. J. Bloodworth, Chairman of the Dursley Gas Light and Coke Company, to welcome the guests and to ask Sir Lionel Darell, Bart., D.S.O., a senior Alderman of the Gloucestershire County Council, to open the valve station as a necessary preliminary to the opening of the valves. It was a historic occasion in that they were about to pass gas from one region into another. He wished to pay tribute to the contractors, Messrs. William Press and Son, who had carried out an excellent job of work. Their courtesy and helpfulness was greatly appreciated, and they had throughout been ready to meet all the demands made on them. He also mentioned the officials who were associated with the undertakings concerned in the present development, particularly Mr. W. A. Chard, Distribution Manager of the Gloucester Gas Light Company; Mr. A. J. Tombs, Assistant Distribution Manager, Gloucester; Mr. T. L. Tallentire, formerly Engineer and Manager of the Dursley Gas Light and Coke Company, and now Engineer and Manager of the Falmouth Gas Company; Mr. H. V. Pye, Mr. Tallentire's successor at Dursley, and Mr. C. F. Matthews, Assistant Engineer and Manager at Dursley. All of them had put in a tremendous amount of hard work to ensure that the job was satisfactorily carried out.

Sir **Lionel Darell,** who was presented by Sir Leslie Boyce with a golden key, then formally unlocked the door and wished the two undertakings every success in their new venture. Inside the valve house, Councillor **B. C. Meehan,** Mayor of Gloucester, opened the valve receiving the gas from the Gloucester works, and Councillor **W. A. Walters,** Chairman of the Dursley Rural District Council, opened the valve passing the gas into the Dursley section of the connecting main. Both of them were presented with souvenir keys by Sir Leslie Boyce, and the guests then proceeded to the New County Hotel, Gloucester, for luncheon.

The Luncheon

Lieut.-Colonel **J. Godman, J.P.,** Chairman of the Gloucestershire County Council, proposed the toast of "The City of Gloucester and the Town of Dursley," and said the day's ceremony celebrated the establishment of another link between the County and the City. In these days when so much was changing, some of it quite rightly so, and when so much more must change, there was a fine stability about our ancient cities and systems of administration. They stood for tradition and for permanency, and although changes must come there was much to be said for keeping their feet on the ground. If this country was to continue to occupy the position it had occupied in the past not only the towns but the countryside must thrive. He did not think the countryside could thrive unless it enjoyed the same conveniences and the same services—he hated the word amenities and would refuse to use it—as the towns, and that day they were celebrating the furnishing of one part of the countryside with a most essential gas service.

Councillor **B. C. Meehan, J.P.,** Mayor of Gloucester, responding, said their hosts were to be congratulated on another important advance in the supply of gas. He was all in favour of maintaining and extending the friendly relationships between the County, the City and the rural districts, and if, on the termination of his period of office as Mayor, those ties had been strengthened, he would feel that he had achieved something worth while.

Councillor **W. A. Walters, J.P.,** Chairman of the Dursley Rural District Council, who also replied, paid a tribute to the Dursley Gas Light and Coke Company. He had been Chairman of the Dursley Parish Council for many years, and they had always endeavoured to ensure that their public gas lighting was second to none in the country. In pre-war days he had seen no town or city better lit than Dursley. There had been close co-operation between the Council and the Gas Company, and one reason for the Company's success was that it had the good sense to accept the advice of experts. Mr. Bloodworth, Chairman of the Gas Company, was born and bred in Dursley, and thanks to the co-operation of the Directors and the skill of the Company's technicians, the undertaking was second to none in the county.

An Almost Complete Network

Mr. **F. Allen, B.Sc.,** General Manager of the South Western Gas and Water Corporation, also replied to the toast. He said the job completed that day was initiated 22 months ago, and considering all the difficulties of shortage of materials, the operation of controls, and other delays, its completion in so short a time was a matter for satisfaction. The Gloucester-Dursley link was only part of a comprehensive scheme which, but for the intervention of three or four short lengths, might have formed part of a continuous system of mains approximating 200 to 250 miles in length. It was no accident that the loose ends of some of those mains were waiting to be connected by somebody in the Somerset coalfields. He felt that the Severn Valley Gas Corporation and the South Western Gas and Water Corporation could take reasonable pride in having encouraged the development of that system over a period of years.

The **Chairman** proposed the toast of the "Visitors" and said that in the morning's ceremony they had done much more than the launching of a great ship. What they had done would continue to serve the public, in the persons of the consumers in the Dursley district, long after great ships had been broken up. He was glad that the scheme had been conceived and brought to fruition as a further example of the progressive policy of the two companies concerned, both of which were threatened with extinction under the Gas Bill. In addition to those who had taken the leading parts in the morning's ceremony, he welcomed the Chairman of the County Council, the Presidents of the Gloucester Chamber of Commerce and the Chamber of Trade, Mr. F. C. Briggs, Engineer and Managing Director of the Dudley, Brierley Hill, and District Gas Company, and Chairman of the Midland District of the British Gas Council, Mr. James Carr, Director, Engineer, and General Manager of the Bristol Gas Company, and Mr. G. P. Mitchell, Managing Director and Chief Engineer of the Worcester New Gas Light Company. He also welcomed the representatives of the contractors, who had carried out the work so successfully.

Councillor **H. T. Bush, J.P.,** Mayor of Cheltenham, responded for the visitors, and expressed the hope that nationalization would not mark the end of all such functions.

1948 "JOURNAL" DIRECTORY

In order to keep the Directory information up to date, the following alterations and corrections which have been notified during the past month should be noted in the 1948 issue of the "JOURNAL" Calendar and Directory:

Page 32.—GAS LIGHT AND COKE COMPANY.—Dr. J. Burns, *Dep. C.E.*
" 70.—SPALDING.—W. J. G. Bryce, *Dep. E.*, vice R. C. Arnold (who has been promoted to *E. & M.*).
" 90.—FORFAR.—A. W. Farquhar, *E. & M.*, vice H. B. Skea.
" 90.—FRAZERBURGH.—Delete A. W. Farquhar, *E. & M.*

Rochdale Gas Department's stand at the recent Rochdale "Silver Lining" Exhibition. The main object of the stand was to promote some general idea of Gas Department work, and the exhibits included a large model of a complete gas-works, gas-fired central heating boiler (alive with switch operation), three model kitchens, working model of glass-fronted meter, working model of a retort house, a research section showing thermostat operation, appliance testing units, and samples of by-products, a statistics board giving information about the Rochdale gas undertaking in comparison with the Gas Industry in general, and numerous photographs of gas-works installations and appliance installations. The attendance at the exhibition was in the region of 20,000 and there was a constant stream of visitors through the Gas Department stand.

WANDSWORTH'S SALES DISCUSSION GROUP

At the last meeting for this session of the Wandsworth and District Gas Company's Sales Discussion Group, an address was given by Mr. Leopold Friedman, Managing Director of De La Rue Gas Development, Ltd., on the subject of the relative

The photograph shows, left to right, Mr. L. A. Van de Velde, Sales Manager of De La Rue Gas Development, Ltd., Mr. F. A. Cheeseman (Chairman of the Group), Sales Manager of the Wandsworth and District Gas Company; and Mr. Leopold Friedman.

merits of instantaneous and storage water heaters. Considerable interest was created among an audience of over 200 of the company's sales staff, and several appliances, particularly the prototype of the boiling water heater, were examined closely. The meeting marked the end of a most interesting session, and it is hoped to resume in October of this year.

STANDARD LIGHTING UNITS

A recommended standard of lighting for single-family dwellings is laid down in Functional Code C.P.7, Chapter VII (F), and the British Standards Institution has now published a specification which will assist manufacturers and users in implementing the requirements of the Code. The specification, B.S.1381, gas lighting units and fittings for single-family dwellings, lays down minimum standards for the efficiency of burners and units, the thermal endurance of glass and silica ware, and the maximum permissible brightness. It also includes tests for the soundness of components of lighting units conveying or controlling gas.

It is not the object of the specification to restrict design, but an appendix stresses the importance of designing units which combine attractive appearance with ease of maintenance and cleaning. The Council of Industrial Design has given valuable assistance in the preparation of the sketches which are included in the specification. Copies of this British Standard are obtainable from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1 (Telephone Abbey 3333), at 2s. 6d. each, post free.

Diary

April 8.—**Midland Counties Coke Association**: Annual General Meeting, 2.30 p.m.
April 9.—**North British Association of Gas Managers**: Spring Meeting, Lesser City Hall, Perth, 11 a.m. (Preceded on Apl. 8 by Golf Competition for the Winson Scott Cup over the King's Course, Gleneagles.)
April 9.—**Institution of Mechanical Engineers**: Extra General Meeting, Discussion on "District Heating" to be opened by A. Stubbs, B.Sc., M.I.Mech.E. Storey's Gate, St. James's Park, 5.30 p.m. Tickets and advance copies of the paper from the Secretary of the Institution of Mechanical Engineers.
April 10.—**Scottish Junior Gas Association (Western District)**: Visit to Dalmarnock Station of Glasgow Corporation Electricity Department (limited to 20 members).
April 12.—**Joint Consultative Committee**: Domestic Development Committee, B.G.C., and Society of British Gas Industries. Gas Industry House, 2.30 p.m.
April 13.—**Federation of Gas Employers**: Central Committee, Gas Industry House, 11.30 a.m.
April 13.—**British Gas Council**: Central Board. Gas Industry House 2.30 p.m.
April 13.—**Midland Junior Gas Association**: "The Problem of Increasing the Revenue from Coke," A. W. J. Harris, Assistant Engineer, Nechells Works of the Birmingham Gas Department. Staff Mess Room, Birmingham Gas Department, 6.30 p.m.
April 14.—**Manchester District Junior Association of Gas Engineers**: Visit to Staveley Coal and Iron Company.
April 16.—**Royal Institution**: "The Gas Industry," Dr. E. V. Evans, 9 p.m.
April 16.—**Institution of Chemical Engineers**: Annual Meeting, Connaught Rooms, 11.45 a.m. Luncheon 1 p.m.
April 16.—**London and Southern Junior Gas Association**: "Laying a Gas Main in the Sea," J. A. Williams, Gas Light and Coke Company. Gas Industry House, 7 p.m.
April 16.—**Scottish Junior Gas Association (Western District)**: Annual General Meeting.
April 20.—**Wales and Monmouthshire Junior Gas Association**: Annual General Meeting, Swansea. Paper by A. G. Saunders.
April 20.—**Gas Research Board**: Annual Meeting, Institution of Mechanical Engineers.
April 27.—**Midland Junior Gas Association**: Annual General Meeting. Film Evening.
April 27.—**Southern Association of Gas Engineers and Managers (Eastern District)**: "Sales and Service Organization for the Smaller Gas Undertaking," Lieut.-Colonel P. G. Wright. Gas Industry House, 2.30 p.m.
April 29.—**Yorkshire Junior Gas Association**: President's Day, Sheffield, 10 a.m.
April 30.—**Manchester District Association of Gas Engineers**: Annual Luncheon and Meeting, Grand Hotel, Manchester.
May. 7.—**North of England Gas Managers' Association**: Annual Meeting, County Hotel, Newcastle, 2.15 p.m. Address by R. D. Keillor.
May 12.—**Domestic Development Committee**: Technical Sub-Committee, Gas Industry House, 10.30 a.m.
May 12.—**Domestic Development Committee**: Gas Industry House, 2.30 p.m.

The name of Friedman-Athill, Ltd., has now been changed to FA-Neat, Ltd., with new head office premises at 295, Regent Street, London, W.1. (Telephone: Langham 2060).

INVESTIGATION ON CORROSIVE MATTER IN METERS

By STANLEY JONES, M.I.Chem.E., M.Inst.Gas E., M.Inst.F., and J. A. SPEERS, M.Sc., A.M.I.Mech.E., M.Inst.Gas. E., M.Inst.F., Middlesbrough Gas Department

FOLLOWING observations of excessive corrosion in meters brought in from the district, tests were carried out in an attempt to find the effect of ammonia in the gas on corrosion. Identical pieces of tinned iron with the cut edges untinned were placed in the gas stream before and after bubbling through a weak solution of ammonia.

The test was carried on for nine weeks, during which time a total volume of 2,250 cu.ft. of gas was passed. At the end of the period the pieces of metal exposed to the gas containing ammonia were found to have considerable quantities of deposit adhering to the edges, while those before the ammonia was added had very small traces of deposit on the edges. The following observations were made:—

(1). The form of growth of both sets of metal strips was identical in both cases, the difference being in magnitude only.

(2). The strips after the ammonia had been added were covered with a film of moisture due to supersaturation of the gas at that point. This may have influenced the growth of deposit. On drying in a desiccator the deposit was hard and adhered firmly to the metal. It was black in colour.

(3). Small quantities of cyanide were found in the spent ammonia bottle, but none was found in the deposit, suggesting that the ammonia removed residual cyanide from the gas.

(4). The quantities of corrosion were too small for accurate analysis, but as far as could be ascertained no sulphur or ammonia could be detected in the deposit.

(5). The deposit was found to contain considerable quantities of free carbon and a heavy organic material which might be a product of polymerization.

(6). The remaining deposit was a compound of iron which turned to iron oxide on heating. It is possible that this might be some organic radical or else sulphide which was too small in quantity for detection.

(7). No trace of tin was found in the deposit, this explaining why the deposit only occurred at the untinned edges or on scratches on the metal.

In order to determine the concentration of ammonia in the gas under the above test conditions, a series of spot tests was made, and the results are tabulated below:—

Date. 1947	Time.	Total Gas Passed, Cu.Ft.	NH_3 Gr. per 100 cu.ft.
Oct. 10	11.30 a.m.	Start	
,, 10	11.45 a.m.	00.2	728.6
,, 10	12.15 p.m.	00.7	728.6
,, 10	2.20 p.m.	02.4	444.5
,, 10	3.30 p.m.	04.7	245.1
,, 10	4.05 p.m.	06 0	167.0
,, 10	4.40 p.m.	08.0	156.2
,, 11	8.55 a.m.	36.8	29.8
,, 11	11.35 a.m.	43.4	28.2
,, 13	5.15 p.m.	114.4	10.4
,, 14	12.10 p.m.	150.7	4.2
,, 15	12.30 p.m.	255.1	1.7
,, 16	4.30 p.m.	387.5	
,, 17	4.25 p.m.	475.9	0.39

It is seen from the above that the concentration of ammonia in the gas was very many times greater than that met with under any circumstances in the gas mains. Nevertheless the quantity of deposit was not very great.

Similar trouble was experienced at Bradford; and a very detailed investigation made there in conjunction with the Department of Chemistry at the Bradford Technical College is described in the "GAS JOURNAL" Vol. No. 248 (1946), Nos. 4353, 4354, 4355, and 4357.

No very conclusive results were obtained, but the following is a brief summary of the findings at Bradford:—

(1). Corrosion is found to be partly due to H_2S. As the gas was at all times free from H_2S the sulphur must have come from either bacteriological action in the gasholders, or from the organic sulphur compounds reacting to form H_2S in the meter. It is suggested that minute traces of ammonia might act as a catalyst in this reaction.

(2). Nitrogenous gum was found in the deposits.

(3). Carbonaceous material probably found from the breaking down of lubricants.

(4). Small particles of solid foreign matter carried forward from the iron pipes.

A further series of tests was carried out to determine the relative effect on the corrosive properties of gas when:—

1. Supersaturated with water.
2. Supersaturated with water with ammonia added.
3. Supersaturated with water and containing H_2S.
4. Supersaturated with water and containing H_2S with ammonia added.

For the purpose of the experiments, identical pieces of tin plate were suspended in four wash bottles, and these were arranged in four trains, each being preceded by a bottle containing water or ammonia respectively.

Tin plate was chosen as before so as to indicate the probable behaviour inside a meter; the edges were not plated.

Gas was passed for a further period of nine weeks, during which a total volume of 2,250 cu.ft. of gas was passed through each set of bottles. The water and ammonia were replenished daily, but the strength of the ammonia in the wash bottles was diluted to give an average quantity of about 7 gr. per 100 cu.ft. in the gas stream.

In view of the findings at Bradford it was suspected that H_2S might be the prime corrosive agent in meters, and the experiments were conducted primarily to determine how far this was true.

(1). *Clean gas supersaturated with water:* A very small amount of black corrosion had formed round the edges where there was no plating. In addition a number of pin points occurred all over the surface, which were apparently at points where the plating was weak and were the source of corrosion building up. The quantity was very small but would obviously build up over an extended period.

(2). *Clean gas with ammonia:* Corrosion occurred in a very similar manner to case (1) except that the quantity was four or five times as great. The deposit built up on the unplated edge, and the pin holes on the sides were coated much more thickly.

(3). *Gas containing sulphuretted hydrogen:* Very heavy corrosion occurred over the whole of the surface. It was particularly noticeable that the unplated edges suffered no more corrosion than the sides. It is clear that sulphuretted hydrogen is very destructive.

(4). *Gas containing sulphuretted hydrogen and ammonia:* Very heavy corrosion occurred on the unplated edges and built up into a thick deposit. The sides, however, became coated with a brown film which appeared to act as an inhibitor. The only corrosion on the sides was at a few points where the surface had been scratched; here extensive corrosion had built up.

Summing up the results, ammonia accelerates the corrosion of untinned steel plate, but does not affect the tinned plate. In the case of gas containing H_2S ammonia acts as an inhibitor to corrosion of the tinplate by reacting with the tin and H_2S to form a protective coating on the surface of the tin. H_2S alone was found to corrode in a most extensive manner.

The Manchester Daily Dispatch *recently organized a successful "Brighter Homes" Exhibition at the City Hall, where Ascot Gas Water Heaters, Ltd., produced another example of efficient and pleasing stand design. Gas was generally well represented and visitors registered a marked interest in instantaneous water heating by gas.*

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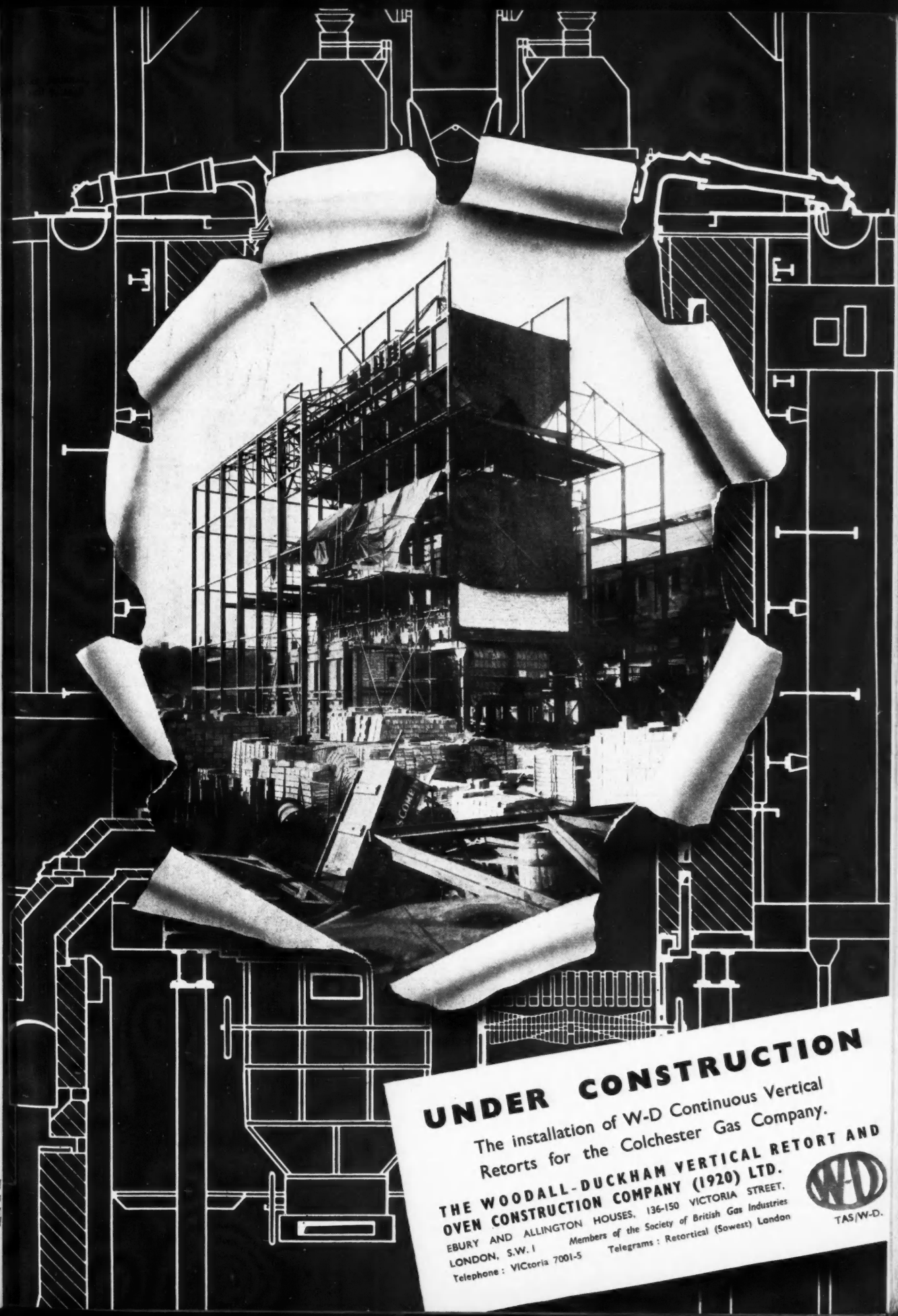

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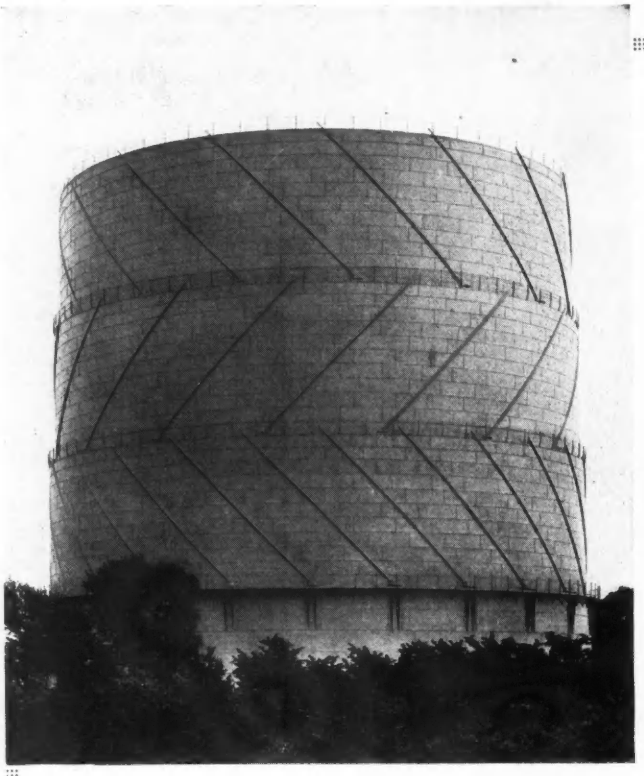

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GAS MANUFACTURING TRENDS IN NORTH AMERICA*

By George F. Knight, General Superintendent of Works, The Consumers Gas Company of Toronto

THE problem of meeting unexpected peak loads, and at the same time maintaining a high load factor so that gas can be made or purchased at a reasonable price, is one that has influenced the trend of production methods. The necessity of meeting these peak loads with old equipment has evolved methods which in so-called normal times did not serve to fire the imagination or bring out the best abilities of the Industry.

Other factors affecting this trend have been the impact of large volume sales, the growing scarcity and higher proportionate cost of labour for coal gas manufacture, the increasing cost, decreasing quality, and the uncertainty of supply of available gas coals; and finally, the extended delivery dates and uncertainty of time of completion of much of the equipment that we would ordinarily install. These factors vary in importance from company to company, but we experience them in different degree in both small and large companies.

Coal Gas

The high capital investment cost and the uncertainty of supply of raw material, its price and quality, the large percentage of labour entering into the cost of the finished gas and the increasing demands of this labour, have had a pronounced effect in creating a definite trend away from the manufacture of coal gas. Where coal gas plants have been built they have usually been in large units so that the benefits of labour-saving devices and mechanization can be secured as an offset to high labour costs. This trend has been observed several times before in the past 25 years, first when natural gas became available in large quantities and methods were evolved for transporting it long distances by pipelines, and again when supplies of cheap bunker and residuum-oils came on the market for use in water gas manufacture.

Canada is in an unfortunate geographical position because the available sources of native coal are far removed from the large centres of population. In many cases, and particularly in the case of Ontario, it has not been economically feasible to use Canadian coals for gas manufacture, and raw material has had to be imported from the United States, thereby assuming the increased burden and uncertainties of rising mine costs, transportation charges, fluctuating exchange rates, and difficulties in deliveries due to weather conditions, as well as labour conditions in the coalfields, on the railroads and in the Great Lakes shipping.

In England, where we usually look for improvements in coal gas manufacture, there does not appear to be any outstanding new development. Many of the plants ravaged by war are being rebuilt and several are being modernized and reconstructed, but mainly along well-established lines. Continuous vertical retorts still have wide acceptance, several improvements in detail having been made resulting in better operating efficiencies, lowered manufacturing costs, and improvements in ease of working. For meeting the peak loads experienced in the British Industry, and to conserve the nation's available coal during the past difficult winter, carburetted water gas has become popular.

Oil Gasification

The technical Press recently reported a method of manufacturing oil gas in a continuous vertical retort that may be of interest to some of us should we find our coal stocks inadequate this winter. Oil was injected into the bottom of an empty continuous vertical retort through an atomizing jet and it was found that, while a retort is not making coke, it is producing at least 76% more therms without any labour. The whole of the coal gas plant is enabled to produce a lower calorific value gas. Cracking efficiency of the oil is stated to be well over one therm per gall. and probably in the neighbourhood of 1.3 therms per gall. This process was originated and operated for a considerable time at Pawtucket, Rhode Island, for the purpose of reducing the consumption of coal and production of coke during the summer months. Technically, the equipment worked successfully.

In another plant in England oil was introduced into the top of a vertical retort through a ⅜ in. pipe surrounded by a 1¼ in. steam pipe along similar lines to the method in use some years ago in Vancouver. In the English system the steam serves to prevent cracking of the oil, provides an initial pulverization of the oil, and produces a slight injection effect. Some difficulty was experienced at first from blocking of the steam pipe by gas oil carbon but experimental work determined 8 ft. as the optimum length of the steam pipe. Each retort normally carbonized 7 gross tons of coal per day and with the injection of 3½ gall. of oil per ton of coal there was a 5% decrease in the normal coal requirements.

It is doubtful if any of these methods could be justified economically but they are methods of increasing production to meet peaks at low investment cost and at the same time conserving coal.

At another English plant the extreme peaks of last February were met by adding producer gas to the coal gas stream and at the outlet of the purifiers pumping rectified benzole (and probably gasolene would work just as well) into the gas main through sprays at a pressure of 80 p.s.i. The resulting gas was permanent at holder pressure and last winter's temperatures in England, was of the declared calorific value, and had excellent combustion characteristics.

Carburetted Water Gas

An interesting example of what can be done in a small plant when necessity dictates is the case of Nantucket, Mass., which in 1946 had only a small water gas machine in need of repair but which could be shut down for only a few hours per day as it was their sole production equipment. Actual and potential increases in output made some standby expedient necessary. Two tanks were purchased from a local boiler works and welded together to form one cylinder 5 ft. 6 in. diameter by 40 ft. long. The top 14 ft. is the superheater and is filled with checker brick, the centre is a checkerless carburettor and contains the oil spray so that the carburetting oil is actually sprayed on top of the fire. The bottom of the shell forms the generator with the charging door in the side of the shell about 12 ft. from the ground. The clinker zone in the generator is lined with silicon carbide and the set is equipped with backrun. This set stands in the open without building and is guyed in position with steel cables. The equipment operated successfully through last winter. During a test it produced 30,400 cu.ft. of 530 B.Th.U. gas per hour for a consumption of 3.48 Imperial gall. of gas oil and 27.6 lb. of coke fuel per 1,000 cu.ft.

While methods of making gas to meet peak loads vary widely with individual companies due to conditions peculiar to each plant, the standard water gas set still remains the principal machine for peak load production because of its extreme flexibility and its ability to utilize a wide range of raw materials.

Where set capacity has been increased results were accomplished by increasing throughput of raw materials, something which is very easy to say but not quite so easy to accomplish. An increase in throughput of one raw material must be accompanied by an increase in the other raw materials, and limiting factors soon start to appear, quite often in unexpected places and in an inexplicable manner. No one can say with certainty just what is the maximum output of a water gas set.

Considerable percentage increases in what were once thought normal capacities have been made by analytical studies, such as pressure surveys, throughout the entire stream of gas flow from the set to the holder and by the correction of any excessive flow resistance thus uncovered. In plants running at the older usual ratings bottlenecks were not always of too great importance but with increases in set capacities these bottlenecks become accentuated and caution must be used before applying to one's own plant the experience of any other plant method of obtaining increased set output.

Methods for Increasing Output

Some of the methods used for increasing output have been as follows:

1. Speeding up of valve action to cut down time when set is not making gas.
2. Higher blast pressures or main capacity to permit higher rates of air input.
3. Adoption of automatic controls to permit shorter cycles, giving more uniform fire conditions and better maintenance of heat in checkers.
4. Installation of modern cone bottom washboxes and reduction in back pressures in box.
5. Substitution of carborundum generator linings for firebrick, to prevent clinker adherence and, in some cases, to give increased grate area by the use of thinner blocks.
6. Automatic devices for more correctly proportioning generator air and carburettor air so that air input to generator can be kept at a uniform rate in cubic feet per minute.
7. Use of more extended blow-purge and blow run with the use of some method, such as the Willien-Stein method, of reforming on the backrun to adjust the heavier gravity gas thus made.
8. Use of mechanical generators, though the general opinion is that there is not much gain in capacity except for the additional operating time, which can be extended from about the usual 20 hours to 23½ hours per day.

Much time and study have been given to these and other methods, most of which have as their objective the cutting down of non-producing time in the cycle.

* From a paper presented at the 40th Annual Convention of the Canadian Gas Association.

The contribution of the use of exhaust steam accumulators to the economies of water gas making should be mentioned. This use dates back to about 1918 but in recent years their adoption has become more widespread as increasing outputs have made mounting demands on steam-raising equipment. The utilization of exhaust steam from plant auxiliaries for use in water gas manufacture in place of high pressure steam can be justified in even the smaller plants.

Twin Generator Oil Gas Process

Considerable interest has been shown in a modified water gas set now in operation in Buffalo, known as the Twin-generator Oil Gas Process. A standard three-shell water gas set was utilized and the following structural changes made to permit the use of oil in place of solid fuel in the generator:

1. Blast lines, cross-over between generator and carburettor, generator grate, three-way valve and backrun piping removed.
2. Lower connecting manifold installed between generator and carburettor.
3. Checker brick added in generator.
4. New blast line, oil and steam lines installed to top of generator and carburettor.
5. Changes to automatic control nest.

During the first part of the cycle the heating oil and air are admitted simultaneously to generators No. 1 and No. 2, the latter being the former carburettor. This oil in burning heats the checkers in all three shells and the waste products pass to atmosphere through the stack valve at the top of the superheater. The blow part of the cycle continues until a temperature of 1,600° F. is reached at the top of the superheater checkers, at which time the air and heating oil are shut off and the make oil and make steam turned on. The stack valve is closed and the make gases pass to the washbox and relief holder.

At Buffalo there are two 12 ft. sets, one of which has been converted to oil gas operation. The capacity of the converted set has increased from 150,000 cu.ft. per hour of 560 B.Th.U. gas to 325,000 cu.ft. at 900 B.Th.U., and it is expected that when the offtakes are enlarged the set will make 400,000 cu.ft. at 900 B.Th.U. The specific gravity of the gas is 0.82. The oil used is No. 2 or No. 3 and it is stated that the oil consumed in U.S. gall. per 1,000 cu.ft. is 1.5 gall. for heating and 9.5 gall. for gas making. The cycle is of four minutes duration and one man could operate the set although two are being used at present. During February, 1947, the set operated for 144 consecutive hours without being shut down.

The advantages claimed for this type of set are elimination of fire cleaning and charging; continuous, uniform, 24-hour operation; the oil is cracked in a controlled steam atmosphere; increased output is obtained for the minimum capital investment.

In general, the trend in water gas manufacture shows the effect of increasing labour costs and the necessity of obtaining larger outputs per dollar of investment. Larger and larger sets are being built with the amount of operational labour required reduced to a minimum. One of the latest sets in course of construction has a 10 ft. diameter mechanical grate to give 24-hour continuous operation and elimination of the arduous work of fire cleaning, and is capable of producing 12 million cu.ft. daily. Fuel charging and valve operation will be completely automatic.

In the smaller plants such complete mechanization would not be economically feasible but there is a tendency to instal automatic control nests and to step up set capacity to points previously thought unattainable. Much of this has been necessary in order to meet increased send outs during years when new equipment was unobtainable and most plants are now working to the limit of their installed capacity so that further measures are necessary.

Liquefied Petroleum Gases

The last year has seen a greater use of liquefied petroleum gases, mainly propane, in the manufacture of gas. Many successful installations utilizing this method of meeting peaks are in full scale operation in various forms, and several Canadian companies are giving serious consideration to its adoption. It should, however, be clearly kept in mind that commercial propane is not at present available in Canada and it is stated by one of the large oil companies that supplies of propane from refinery gases will not be on the market before 1949. All supplies at present are imported from the United States and even in that country many companies are not sure that their requirements for the winter will be met.

Propane and butane are the main liquefied petroleum gases obtained from the natural gas industry in the oil fields and the same products, as well as their unsaturated hydrocarbons—propylene and butylene—are present in the gases leaving cracking stills in oil refinery operations. Butane is not economically available to the Industry due to its higher monetary value in aviation gasolene and automobile gasolenes and its use in the manufacture of synthetic rubber. Where a reliable supply of propane is available it may be utilized in many ways in gas manufacture or to ease the load on existing equipment.

Liquid propane is withdrawn from tank cars into storage tanks and the propane vapour released from the top of the storage tanks as required. Its pressure is reduced by regulators to that carried in the city distribution system into which it is introduced directly. Undiluted propane vapour has a calorific value of over 2,500 B.Th.U. per cu.ft. so that the volume of gas used by a consumer is about one-fifth of the amount required of 500 B.Th.U. manufactured gas.

Due to the limitations imposed by the permissible specific gravity straight undiluted propane gas will not operate satisfactorily in appliances in which the orifices were originally adjusted for manufactured gas. The specific gravity of propane gas is 1.52 which is above the usual limit of an increase of 20% more than manufactured gas.

Propane Air Mixtures

In cases where propane is used for peak loads and mixed with a manufactured gas for distribution it is usual to dilute the propane with air and keep the mixture of manufactured gas and propane-air within the usual limits of 10% below and 20% above the specific gravity of the base manufactured gas. In the case of a mixture with coal gas the maximum amount of propane-air that could be added would be 12½% and with carburetted water gas the maximum amount of propane-air that would give satisfactory burner operation would be 30%, unless some method of making low gravity water gas is used. In this case the increase in gas production could be 100%.

In one method of dilution with air that has been widely adopted a small quantity of the undiluted vapour is burned under a heat exchanger through which the liquid propane is circulated and in which it is volatilized. From the heat exchanger the vapour passes through a pressure loaded regulator set at anything from several pounds to 25 lb. at full load. Leaving the heat exchanger the gas enters a mixer consisting of a nozzle and venturi tube with a suitable control mechanism, and in expanding from the nozzle into the venturi tube the undiluted vapour creates a suction which draws in air through a check valve. The mixture of vapour and air is then forced out through the venturi tube to a mixed gas header or surge tank and thence to the distribution system. The proportions of air and vapour can be adjusted by the size of the nozzle and the nozzle pressure to get the desired calorific value in the final gas. The mixer is an "on" and "off" device and load variations are met by varying the ratio of "on" time to "off" time. An oil fogging tank and an odorant tank, as well as pressure storage tanks for liquid propane, are usually required.

Propane-air mixtures have been used as a complete replacement of manufactured gas in some small plants where replacement of old and worn out equipment would mean considerable investment with correspondingly high carrying charges. In cases of complete replacement by propane close attention has to be given to the joints of the distribution system as propane contains no condensible vapours to keep jointing material soft and lubricated.

Propane for Carburettion of Blue Gas

In some instances it has been found expedient to use propane in place of gas oil or heavy oil for carburettion in a water gas set, and its use has been proved to be feasible from an operating standpoint. As no heat is required for carburettion, propane returns to the gas 100% of its B.Th.U. compared to a return of 80% in the case of gas oil, but since a gallon of propane produces a smaller volume of gas than a gallon of gas oil there will result a reduction in set capacity.

The effect of reforming propane in water gas sets has resulted in an increase in set capacity of 30%. Reforming is done in standard water gas machines by passing the vapours through the hot fuel bed. This method of using L.P. gases has proved entirely satisfactory.

Propane for Underfiring

In companies where it has been found advisable to have available the maximum quantities of saleable coke from oven operation or where coal gas formerly used for underfiring has been required for city distribution, propane has been successfully utilized as a substitute fuel. The propane has to be diluted with air or waste gases to approximate the calorific value of the coal gas formerly used and some changes may be necessary to the gas nozzles to compensate for the propane mixture having a higher specific gravity.

This may suggest that the use of liquid petroleum gases in one of its many forms presents the answer to some of our problems. Each individual company must evaluate this fuel in the light of its own particular economics, and must assure itself of an adequate supply when needed. The difficulty of obtaining sufficient quantities and the necessity of storing propane and butane in pressure storage vessels has indicated to the American Gas Association the desirability of using a lower vapour pressure hydrocarbon and work is now being done by that Association on the use of petroleum distillates such as heavy naphtha and gas oil. There is, however, at the present time, a definite trend towards the adoption and use of liquid propane.

Natural Gas

In some parts of Canada for the past two winters the supplies of natural gas have been insufficient to cope with the demand and there is now a trend to import this gas from the United States. One company has under way a project to import natural gas during the summer months and use it for the first few years in repressuring a depleted field so that later the gas may be used in helping to meet winter loads, rather than by the use of substitute gases.

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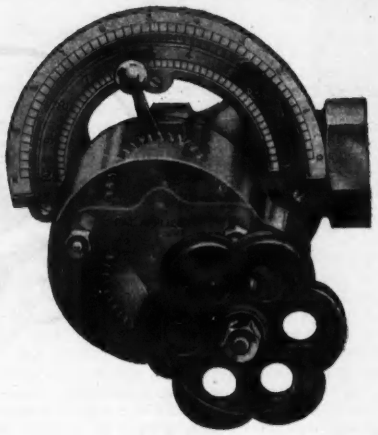

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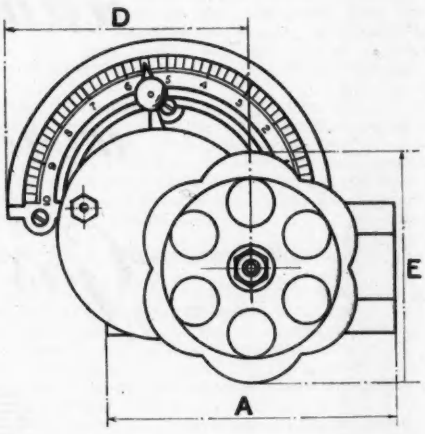

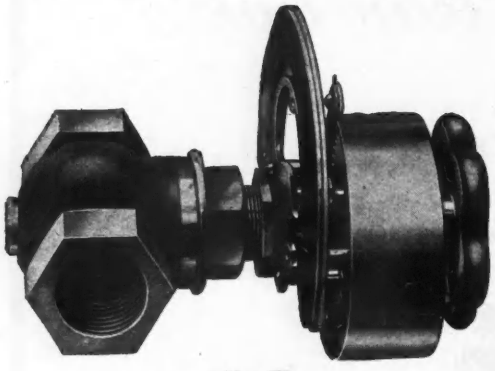

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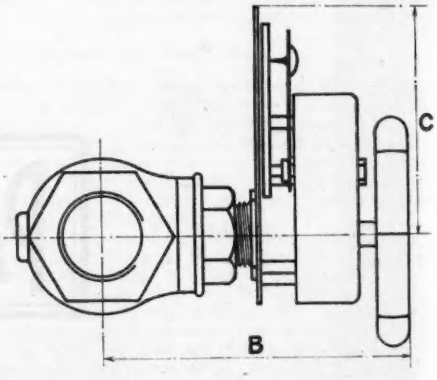

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There is a proposal to transmit natural gas in the Big Inch and Little Inch Lines from the south-western U.S. to the Appalachian area and to the Philadelphia-N.J. area and later to extend and enlarge the system as far as New England. After completion of the Philadelphia-N.J. link, which will take about 12 months, the lines will have a capacity of 425 million cu.ft. per day. Gas supplied to the N.J. area would be used principally to supplement present manufactured gas supplies and for reforming.

In April the U.S. Federal Power Commission was asked to permit natural gas to be moved through these lines to be re-piped for sale as far north as Canada.

The American Gas Association is undertaking a considerable amount of research work for the purpose of providing the Industry with cheaper methods of making gas or evolving new processes utilizing materials not previously found suitable.

Amongst the projects might be mentioned the building of a catalytic cracking plant for the manufacture of a lower gravity gas from hydrocarbon gas or vapour. This plant is now in actual operation and a progress report has been presented. For the continuous gasification of powdered solid fuel, or certain liquid or gaseous fuels, a flash gasification process is being evolved in which the fuel is submitted with steam into a gasification chamber. The solid fuel for use in this process must be in a finely divided state and it has been necessary to develop a flash pulverizer for this purpose.

The adaptation of the so-called fluidizing technique to the productiong of gas appears to offer a promising new process. A finely divided solid, such as fireclay, sand, or coke, is mixed with a gaseous medium like vapourized oil and steam in which the mixture has the behaviour of a boiling liquid. Under proper conditions gasification takes place at a rapid rate.

Research is being continued on the use of oxygen and oxygen-enriched air in gas manufacture but this method could be considered economical only in places where there is a supply of cheap oxygen or where it can be used in a plant built to meet a large base load.

Studies have been made of the fundamental characteristics of the mechanism of the water gas reaction and further work is being considered to interpret this information for the use of operating men.

Most of these are long-range projects and the results will probably not be commercially available to the operating gas men for some time.

The general trend, in its very broadest outline, is admirably suumed up in a recent address by Mr. E. Crowther, Junior Vice-President of the Institution of Gas Engineers, who said:

"We should give our minds to the mechanizing of the more arduous of our processes, the elimination of dirty jobs wherever possible, and the reduction of the total of the Industry's demands upon the labour available. When conditions are stable the policy of an industry follows a proved and well-marked path, but at times like the present, when we are confronted with unfamiliar and rapidly changing conditions, it is imperative that we should be alert to modify our methods as circumstances require. The alternative course, to mark time until 'normal' conditions return, is the short route to extinction."

PRACTICAL FILTRATION IN INDUSTRY

In a paper on "Practical Filtration in Industry," which he presented to a meeting of the Society of Engineers on April 5, Mr. C. G. Vokes, M.I.Mech.E., A.F.R.Ae.S., M.S.A.E., described and illustrated some of the applications where efficient air filtration is essential, and the types of filters used. The war, he said, had shown the necessity for efficient filtration of lubricants, liquid fuels, and air for mechanical equipment operating in dusty conditions, as in many instances it would have been impracticable to operate the equipment successfully without the aid of filtration.

Air filters could be divided into two main classes, dry fabric filters, and filters relying on viscous impingement. The suitability of either was somewhat dependent upon the application, but it was generally considered that the former type could attain a higher degree of dust removing efficiency. Tests had been conducted to determine the relative efficiencies of both types, and these had proved the dry type to give the most satisfactory all-round results, the efficiency of the viscous filter varying more widely with changes in dust particle size and shape.

Quantities of dust were always present in the atmosphere and the airborne dust found in country districts could be very abrasive. In order to determine the value of filtration on mechanical equipment, a conventional 8 H.P. engine was equipped with various filters and subjected to a series of tests to determine the degree of protection afforded in dusty conditions. These tests had shown that an efficient air filter brought about a very considerable reduction in wear. The addition of a full-flow oil filter in conjunction with the air filter reduced the wear to a negligible quantity, while a test with the same air filter with the substitution of a by-pass or partial oil-flow filter had indicated that this type of equipment did not afford the same standard of engine protection.

Filtration of air also played an important part in protecting internal decorations and manufacturing products, and in addition was in many instances a satisfactory means of recovering valuable dusts evolved during manufacturing processes.

SHORT COURSES FOR TEACHERS

A short course for teachers of gas engineering and gas fitting in recognized technical colleges and evening institutes in England and Wales will be held at Newcastle from July 17 to 24 under the direction of H.M. Inspector Dr. P. C. L. Thorne, assisted by other Inspectors. The purpose is to consider the methods of instruction in Gas Engineering (Manufacture and Supply) and in Gas Fitting, and the course will include lectures and discussions on teaching methods and devices, on the use of the voice, of the blackboard, and of other visual aids.

The treatment of the standard syllabuses for these subjects will also be considered. There will be lectures on some modern aspects of gas manufacture, distribution, and utilization, and a number of visits to works. The work of the course will be carried out mostly at the Rutherford Technical College, by permission of the local education authority and the Principal.

Through the kindness of the Rector of Armstrong College and the Warden, accommodation will be available at Henderson Hall, Cochrane Park, for a limited number of teachers. Members selected for admission must be prepared to attend throughout the course and to comply with any rules which may be laid down, to ensure the satisfactory conduct of the course. Subject to regular attendance and compliance with the rules, the Ministry of Education will repay the actual expense of travelling necessarily incurred by a teacher for the purpose of the course if in excess of 10s. Application to attend the course must be made on Form 106 R.S.C. in accordance with the instructions on the form. Copies of the form may be obtained from the Institution of Gas Engineers, or from the Ministry of Education (Short Courses) 14-22, Lennox Gardens, S.W.1. Applications must reach the Ministry by May 15.

HOME SERVICE AT BRISTOL

From the Bristol Gas Company we have received a Report of the activities in 1946 and 1947 of the Company's Home Service Department, in which it is pointed out that the ever growing demand for more gas and new and better appliances in a world of acute shortages, together with the housewife's enlightenment and thirst for knowledge on all aspects of home management, has almost revolutionized home service work and development. The Report goes on to say:

The schoolgirl of 1939 is the young housewife of 1948 and one of the biggest obligations of home service personnel is to make her conscious of the value of up-to-date modern gas equipment in her home. With this in mind a series of 12 practical cookery classes has been organized for young brides, staff of the G.P.O., factories, housewives, members of Red Cross detachments, and others in conjunction with the local education authority. At the end of these courses every successful candidate is awarded a Certificate of Proficiency, and nearly 200 of these Certificates have been given. The value of these classes is that, although the number of students is small, not exceeding 20, each student has the opportunity of using and handling gas equipment.

During 1946 and 1947 over 300 cookery demonstrations and nearly 100 lectures have been given to audiences, totalling 20,309, comprising members of Townswomen's Guilds, Women's Institutes, the Labour and Co-operative Movement, Unionists, the British Legion, Youth Clubs, the Red Cross, Church and Chapel Guilds, and members of the general public. Close contact is maintained through the secretaries of 200 women's organizations, involving a membership of over 13,000 women, by monthly circularization with pamphlets, recipes, and news of forthcoming Home Service programmes. Lunch-time demonstrations for business girls have proved a popular feature, now running in its 10th month. The programme is a comprehensive one, dealing with the many aspects of home management.

Her Grace the Duchess of Beaufort kindly consented to open a Women's Gas Council Homecraft Course for 130 members of the Bristol Unionist Association. Miss Pidsley, Assistant Secretary, of the Women's Gas Council, presented badges at the completion of the course.

A Home Service Bureau in the showrooms attracts a very large number of Bristol housewives, who take a keen interest in the constant and changing variety of handbills and leaflets offered to them. A bulletin containing seasonable recipes, household hints, and information of Home Service activities is issued four times a year. Owing to paper restrictions the number of copies is very limited and falls far short of requirements. The local Press is most helpful and very willing to give publicity, through the women's pages, to any event. Demonstrators visit, whenever requested, any consumer who has difficulty in using an appliance and carry out any necessary cooking and laundry-work demonstrations.

A 16 mm. sound projector was purchased by the Company a few months ago and is being used to supplement demonstrations and for independent programmes. The shows vary widely to include gas industry, cartoons, travalouge, and films of topical interest.

Durham City Council has been informed by the Town Clerk (Mr. G. R. Bull) that neither the Ministry of Fuel and Power nor the Ministry of Transport had powers to enforce their request to local authorities to cut down their street lighting to 50% of the pre-war standard.

GAS STOCKS AND SHARES

Following the Easter holiday, stock markets opened quietly and became more cheerful as the week passed, partly under the influence of the electricity vesting operation on Thursday and partly because of a more optimistic outlook regarding the Budget. The new electricity compensation stock is to be a British Electricity Guaranteed 3% Stock, 1968-1973, and is issued to former electricity stockholders as compensation at par. Prices of gilt-edged securities were very steady pending the announcement of the electricity terms, the average showing no variation throughout the week.

Price changes in the industrial market were irregular, but showed generally an upward tendency; indeed, the *Financial Times* industrial ordinary index, at 118.2, ended the week higher than at any time since the first week of January.

In the gas stock market recent averages were maintained in regard to transactions recorded in the week before Easter, but last week the daily average fell from round 73 to 55. Imperial Continental Gas Association advanced 2 points to 122-127, but several other overseas undertakings showed slight decreases.

Last Thursday's quotations compared with those for Mar. 18 showed the following rises and falls:

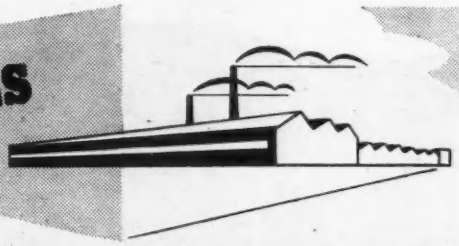
OFFICIAL LIST

Bournemouth, Std. 5 p.c. Sliding Scale	163	—168	+	2
Cambridge U. & T. Orig. 10 p.c. Cons.	194	—200	+	8
Colombo, Ltd., ord.	33/	— 38/	—	2s.
Colonial Gas Assn. Ltd., Ord. (xd. Mar. 31)	16/6	— 18/6	—	6d.
Commercial ord.	87	— 92	—	1
Great Yarmouth, 8½ p.c. max.	13	— 14	+	¼
Hartlepool G. & W., 5 p.c. ord.	92	— 97	+	1
Imperial Continental, cap.	122	—127	+	2
Lea Bridge, cons. ord. (xd. Mar. 31)	129	—134	—	1
Newcastle & Gateshead, ord.	24/9	— 25/9	+	3d.
Primitiva Holdings, ord.	10/	— 12/	—	6d.
Romford, ord.	107	—112	+	2
South Eastern, ord.	21/6	— 22/6	—	3d.
South Metropolitan, ord.	97	—100	—	1
United Kingdom, ord.	22/9	— 23/9	+	3d.
Uxbridge, &c., 5 p.c. Cap.	118	—123	+	1
York cons., ord. (xd. Mar. 31)	95	—100	—	2

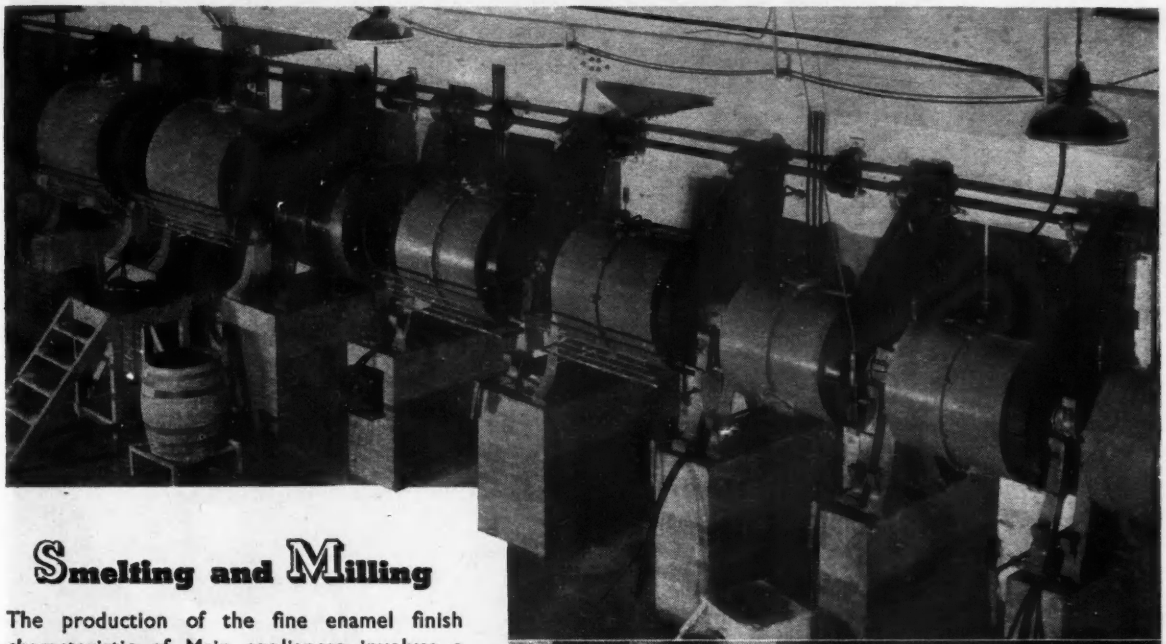
Quotations on the London Stock Exchange

When last ex-Dividend	Dividends Interest, % Last Yr.	Prev. Yr.	NAME.	Quotations April 1
Feb. 25	4	4	Alliance & Dublin Cons. Ord.	22/ —23/
Oct. 29	5	5	Assd. Gas & Water U'd'tgs Ord.	21/6—23/6
"	6	6	Do. Deferred	22/ —24/
Mar. 10	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/ —21/
"	4	4	Do. 4 p.c. Red. Cum. Pref.	18/6—20/6
"	4	4	Do. 4 p.c. Irred. Cum. Pref.	17/6—19/6
Feb. 11	7	7	Barnet Ord. 7 p.c. max.	152—157
Feb. 25	5	5	Bath Cons. Ord. 5 p.c. basic	100—105
Sept. 17	6½	10	Bombay, Ltd., Stock	46/- -49/-
Mar. 10	8½	8½	Bournemouth Std. 5 p.c. sliding scale	163—168
"	7	7	Do. 7 p.c. max. div.	152—157
"	4	4	Do. 4 p.c. Pref.	95—100
"	6	6	Do. 6 p.c. Pref.	122—127
Feb. 11	3½	3½	Do. 3½ p.c. Red. Deb.	97—102
Dec 10	4	4	Do. Perp. 4 p.c. Deb.	98—103
Feb. 25	5·35	5·35	Brighton, &c., 5 p.c. Std. Cons.	101—103
	6·3	6·3	Do. 6 p.c. Std. Cons.	108—113
Dec. 10	5	5	Do. 5 p.c. Perp. Deb.	117—122
Feb. 25	5	5	Bristol, Gen. Cap. 5 p.c. max.	111—116
Dec. 10	4	4	Do. 4 p.c. New Deb. Red.	95—100
Mar. 10	7½	7½	Brit. Gas Light Ord.	124—129
Dec. 31	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	107—112
Dec. 10	4	4	Do. 4 p.c. Red. Deb.	92— 97
Feb. 11	10	10	Cambridge U. & T. Orig. 10 p.c. Cons.	190—200
"	5	5	Do. 5 p.c. Cons. 'C'	95—100
"	7	7	Do. 7 p.c. Cons. 'B.'	135—140
Oct. 15	4½	4½	Cape Town, Ltd., 4½ p.c. Cu. Pf.	17/ —19/
Feb. 11	6½	6½	Cardiff Con. Ord.	117—122
Mar. 10	5	5	Cheltenham, 5 p.c. basic Cons. Ord.	99—104
Dec. 10	4	4	Do. 4 p.c. Perp. Deb.	93— 98
Feb. 11	5¾	5¾	Chester United Ord.	105—110
Oct. 29	—	7	Colombo Ltd., Ord.	33/ —38/
"	—	7	Do. 7 p.c. Pref.	22/6—24/6
Mar. 31	5	5	Colonial Gas Assn. Ltd. Ord.	16 6—18 6xd
"	—	8	Do. 8 p.c. Pref.	23 6—25/6xd
Jan. 28	5	5	Commercial Ord.	87— 92
Dec 10	3	3	Do. 3 p.c. Deb. Perp.	70— 75
Feb. 11	5	5	Do. 5 p.c. Irred. Deb.	107—112
"	6	6	Croydon sliding scale	118—123
"	5	5	Do. max. div.	101—106
"	4	4	Do. 4 p.c. Irred. Pref.	93— 98
Dec. 31	4	4	Do. 4 p.c. Perp. Deb.	95—100
"	5	5	Do. 5 p.c. Perp. Deb.	117—122
Feb. 11	8	8½	Derby Cons. Ord.	132—137
Dec. 10	4	4	Do. 4 p.c. Red. Deb.	92— 97
Feb. 11	5	5	East Hull Ord.	90— 95
"	5	5	East Surrey 'B,' 5 p.c.	97—102
"	6	6	Do. 6 p.c. Cum. Pref.	115—120
"	5	5	Do. 5 p.c. Irred. Deb.	117—122
Dec. 31	6⅝	6⅝	East Wight Cons. Ord.	107—112
Feb. 26	5	5	Eastbourne 'A'	95—100
Mar. 10	3½	3½	Do. 'B'	93— 98
"	5	5	Gas Consolidation Ord. 'A'	20/6—22/6
Nov. 12	5	5	Do. Ord. 'B'	20/6—22/6
"	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6
Feb. 11	5	5	Gas Light & Coke Ord.	22/6—23/6
"	3½	3½	Do. 3½ p.c. max.	77— 82
"	4	4	Do. 4 p.c. Con. Pref.	97—102
"	3¾	3¾	Do. 3¾ p.c. Red. Pref.	95—100
Nov. 26	3	3	Do. 3 p.c. Con. Deb.	84— 89
"	5	5	Do. 5 p.c. Deb.	102—107
"	4½	4½	Do. 4½ p.c. Red. Deb.	102—107
Mar. 10	3¼	3¼	Do. 3¼ p.c. Red. Deb.	92— 97
"	5	5	Gloucester Cons. Ord.	93— 98
Feb. 11	4	2	Great Yarmouth (8½ p.c. max)	13 — 14
Feb. 25	7½	7½	Guildford Cons. Ord.	127—132
"	5	5	Hampton C't, 5 p.c. Cons. Ord.	95—100
"	5	5	Hartlepool G. & W. 5 p.c. Ord.	92— 97
Oct. 1	—	6	Hastings & St. L. (5 p.c. Std.)	95—100
"	—	5	Do. (3½ p.c. Std.)	87— 92
June 18	7½	6	Holyhead & N. Wales Ord.	20/—22/6
Mar. 10	5	5	Hornsey 3½ p.c. Std.	87— 92
"	—	6⅛	Do. 5 p.c. Std	107—112
May 14	8½	8	Imperial Continental Cap.	122—127
Jan. 28	3½	3½	Do. 3½ p.c. Red. Deb.	95—100
Mar. 31	—	7½	Lea Bridge Co., Cons. Ord.	129—134xd
Feb. 11	5½	5½	Liverpool 5 p.c. Crd.	119—124
Mar. 10	7½	7½	Luton Cons. Ord. 'A'	145—150
"	6½	6½	Do. Ord. 'B'	110—115
Jan. 14	7	7	Malta & Med'n., 7 p.c. 1st Pref.	100—110
"	7½	7½	Do. 7½ p.c. 2nd. Pref.	105—115
Feb. 25	5⅝	5⅝	M.S. Utility 'A' Cons.	99—104
"	5⅝	3⅝	Do. 'B' Cons.	68— 73
"	5	5	Do. 'C' Cons.	100—105
"	4	4	Do. 4 p.c. Cons. Pref.	95—100
Oct. 29	4	4	Montevideo, Ltd. Ord.	120—125
Feb. 11	5⅜	5⅜	Newcastle and Gateshead Ord.	24/9—25/9
Dec. 31	3½	3½	Do. 3½ p.c. Perp. Deb.	90— 95
Mar. 31	7	7	Newport (Mon.) Cons.	92— 97
Dec. 10	5	5	Do. 5 p.c. Perp. Deb.	110—115
Mar. 31	—	6⅜	North Middlesex 6 p.c.	117—122xd
"	5	5	Do. 5 p.c. Pref.	105—110xd
Feb. 11	5	5	Northampton Cons.	102—107
"	9½	10	Oxford, Cons. Ord.	195—205
Dec. 10	5⅜	5⅜	Plymouth & Stone Ord.	107—112
"	8½	8½	Do. Addl.	13½— 14½
"	7⅜	7⅜	Do. New	12⅜— 13⅜
Mar. 10	5	5	Do. 5 p.c. Deb. Perp.	117—122
Feb. 11	7½	7½	Portsmouth & Gosport Cons.	143—148
"	5	5	Do. 5 p.c. max.	97—102
"	10	10	Preston 'A'	170—180
"	7	7	Do. 'B'	125—130
June 24	2	4	Primitiva Holdings, Ltd. Ord.	10/ —12/
Dec. 10	—	6	Do. 6½ p.c. Red. Cum. Pref.	100—105
Feb. 11	5	5	Reading, 5 p.c. max.	94— 99
"	—	—	Do. 4 p.c. Perp. Deb.	92— 97
Dec. 10	4	4	Do. 3¾ p.c. Red. (Non-Cum.) Pref.	92— 97
Feb. 11	5	5	Romford, Ord.	107—112
Mar. 31	4	4	Do. 4 p.c. Debs. Red.	95—100xd
Sept. 17	—	7½	Severn Val. Ltd. Ord.	22/6—23/6
Feb. 25	4½	4½	Do. 4½ p.c. Cum. Pref.	20 3—21/3
Feb. 25	6½	6½	Sheffield Cons.	142—147
Dec. 31	4	4	Do. 4 p.c. Red. Deb.	92— 97
Sept. 3	—	6	South East'n Gas Ltd. Ord.	21/6—22/6
Mar. 10	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	20 6—21/6
"	4	4	Do. 4 p.c. Irred. Cum. Pref.	19/—20/-
Feb. 11	5	5	South Metropolitan Ord.	97 —100
"	6	6	Do. 6 p.c. Irred. Pref.	122 —127
"	4	4	Do. 4 p.c. Irred. Pref.	96 — 99
"	3	3	Do. 3 p.c. Perp. Deb.	81 — 86
"	5	5	Do. 5 p.c. Red. Deb.	97 —102
Jan. 14	5	5	South Suburban Ord. 5 p.c.	112 —117
Jan. 28	5	5	Do. 5 p.c. Perp. Pref.	108 —113
"	5	5	Do. 4 p.c. Perp. Pref.	94 — 99
"	4	4	Do. 3½ p.c. Red. Pref.	90 — 95
"	3½	3½	Do. 5 p.c. Perp. Deb.	118 —123
Dec. 10	5	5	South West. G. & W. Ltd. Ord	19/— —21/-
Sept. 17	—	5½	Southampton Ord.	100 —105
Feb. 11	5	5	Sunderland Ord.	110 —115
Jan. 28	6	6	Swansea Ord.	81 — 86
Feb. 11	4½	4½	Do. 5½ p.c. Red. Pref.	98 —103
"	5½	5½	Swindon Cons. Ord.	109 —114
Mar. 10	7	7	Tottenham Ord.	115 —120
"	5	5	Do. 5 p.c. Pref.	107 —112
"	5	5	Do. 5½ p.c. Irred. Pref.	115 —120
"	5½	5½	Do. 4 p.c. Perp. Deb.	94 — 99
Dec. 10	4	4	Tunbridge Wells, 4 p.c. Sliding	123 —128
Oct. 1	—	7½	U. Kingdom Ltd. Ord.	22/9—23/9
Nov. 12	—	7	Do. 4½ p.c. 1st Cum. Pref.	22/—23/-
"	4½	4½	Do. 4 p.c. 1st Red. Cum. Pref.	19/ —20/
"	4	4	Do. 4½ p.c. 2nd Non. Cum. Pf.	19/ —20/
Dec. 10	4½	4½	Do. 3½ p.c. Red. Deb.	92 — 97
Mar. 10	3½	3½	Uxbridge, &c., 5 p.c. Cap.	118 —123
Aug. 6	—	6⅜	Do. 5 p.c. Pref.	103 —108
"	5	5	Do. 5 p.c. Perp. Deb.	116 —121
Nov. 26	5	5	Wandsworth Cons.	117 —122
Feb. 11	5	5	Do. 4 p.c. Pref.	97 —102
"	4	4	Do. 5 p.c. Irred. Deb.	120 —125
Dec. 10	5	5	Do. 4 p.c. Irred. Deb.	95 —100
"	4	4	Watford & St. Albans Ord.	116 —121
Jan. 28	5	5	Do. 5 p.c. Pref.	102 —107
"	5	5	Do. 5½ p.c. Pref.	117 —122
"	5½	5½	Weymouth Ord. (5 p.c. Basic)	90 — 95
Feb. 11	5	5	Woking District "A" Ord.	180 —190
"	10½	11	Do. "B" Ord.	125 —130
"	7.35	7·7	Wolverhampton Cons. Ord.	118 —123
Feb. 11	7½	8	York Cons. Ord.	95 —100xd
Mar. 31	5	5		

BEHIND THE SCENES



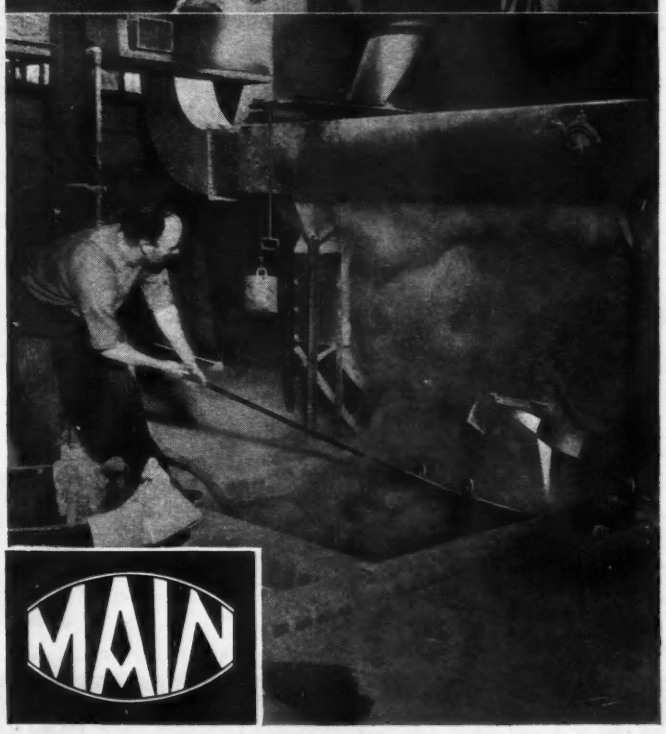
IN THE MANUFACTURE OF MODERN GAS APPLIANCES



Smelting and Milling

The production of the fine enamel finish characteristic of Main appliances involves a series of interesting operations. First, the powdered ingredients are weighed, carefully mixed together according to the type of enamel required, and put into the smelting retort. Here they are subjected to a temperature between 1,050° C. and 1,100° C. which reduces the powders to a molten mass. When this has reached the desired temperature and viscosity, the retort is revolved and the contents poured into a trough of water, which causes the "metal" to disintegrate and produce what is known as "frit." This is carefully dried, inspected and weighed and oxides are added according to the colour required. It is now ready for the "milling" process in rotary drums half filled with stone grinding balls. The "frit" is mixed with water and is ground for 8 to 10 hours until it is reduced to a smooth suspension of enamel ready for application to the various parts of gas appliances requiring this particular finish.

The upper illustration shows rotary grinding mills, the lower, white-hot "metal" being poured from the smelting retort.



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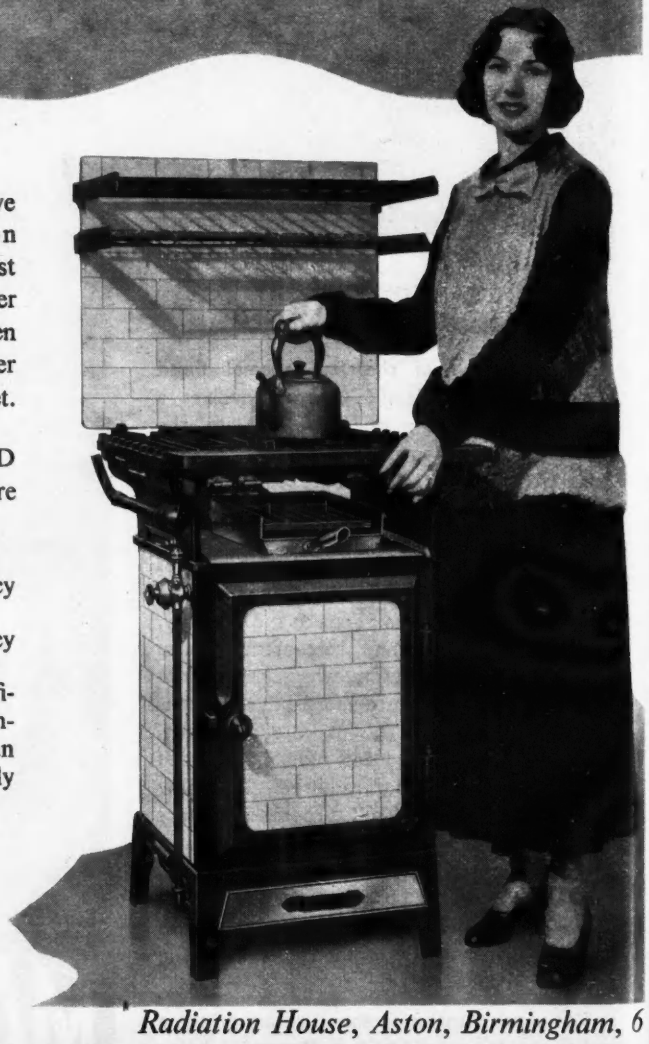
GAS COOKER *with Regulo-control*

IN April 1923—twenty-five years ago—Radiation Limited introduced the first NEW WORLD Gas Cooker with Regulo Automatic Oven Heat Control and Single Burner Oven with Bottom Flue Outlet.

For this first NEW WORLD the following advantages were claimed:

1. A higher cooking efficiency
2. A higher thermal efficiency
3. A higher domestic efficiency, with greater simplicity in operation than any appliance previously evolved.



Product of Radiation Ltd.

Radiation House, Aston, Birmingham, 6

NEW WORLD NEW WORLD NEW WORLD

25 years of progress

NEW WORLD

IN April 1948, the latest NEW WORLD Gas Cooker, the No. 1430, still retains the basic features—Regulo control, single oven burner, and bottom flue outlet—developed to even higher standards.

In design, in cooking and thermal efficiency, in ease of cleaning and simplicity of operation, progress has been equally significant.

There are two million satisfied users of NEW WORLD Gas Cookers.

NEW WORLD No. 1430 Gas Cooker

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Product of Radiation Ltd

NEW WORLD NEW WORLD NEW WORLD

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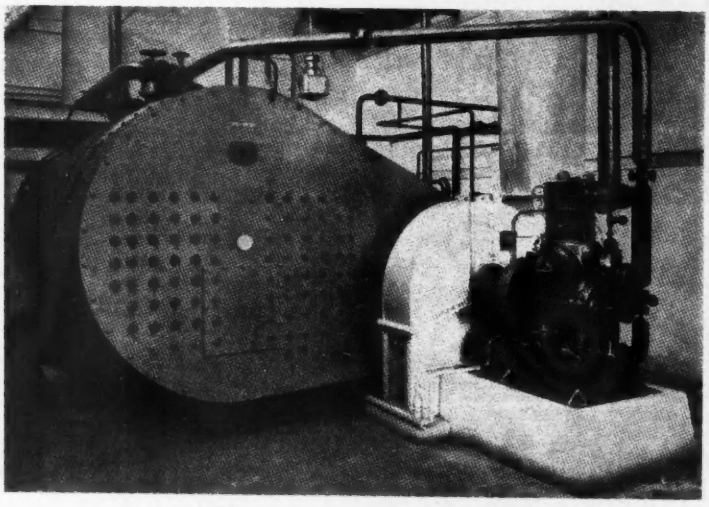
SISSON STEAM ENGINES
FOR LONG PERIOD CONTINUOUS RUNNING

HIGH SPEED
TOTALLY ENCLOSED
MECHANICAL LUBRICATION
SPEED ADJUSTMENT GEAR
DUST EXCLUDING FITTINGS (if required)

■

EXCEPTIONALLY LOW STEAM CONSUMPTION UNDER VARYING LOADS OBTAINED BY SISSON PATENT AUTOMATIC CRANK-SHAFT GOVERNOR



SISSON ENGINE DIRECT COUPLED TO FAN FOR SPENCER-BONECOURT WASTE HEAT BOILER

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C.W.G. PLANT
BENZOLE AND AMMONIA WASHER
ELEVATORS.
BY DIRECT COUPLING, CHAIN, BELT OR GEAR

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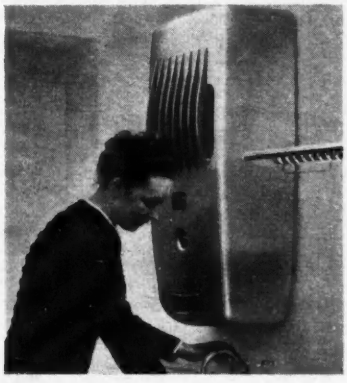
TRADE NEWS

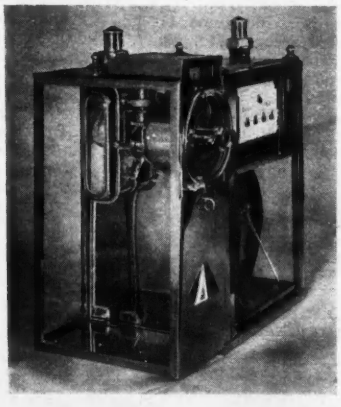
Some months ago it was reported that the Visco Engineering Co., Ltd., had received an order for a "Visco" patent rotating self-cleaning air filter with a capacity of 360,000 cu.ft. per minute for a steelworks in this country. It is now announced that the Company has received a contract for a panel type viscous air filtration plant with 10 times the capacity, *i.e.*, 3,600,000 cu.ft. per minute. This plant will, it is believed, be the largest air filter in this country and possibly in the world.

* * *



De La Rue Multipoint Water Heater shown at the "Brighter Homes" Exhibition, Manchester. (Photo: *Manchester Evening Chronicle.*)

* * *



An exhibition meter recently completed by George Wilson Gas Meters, Ltd. It is almost entirely visual, being panelled throughout in glass, showing clearly the intricate construction of a gas meter in general and the action of this type in particular.

COMPANY NEWS

Gibbons (Dudley), Ltd.—Net profit for 1947 after providing for taxation and depreciation is £48,221. A dividend of 10% and a bonus of 7½% on the Ordinary shares, less tax, making 17½% in all for the year, of which 7½% has already been paid, absorbs £12,873, and the carry-forward is £23,588 compared with the £21,079 brought in from 1946. The Chairman, Mr. W. E. Gibbons, in his statement circulated with the accounts, says the Company continues to have a brimful order book and the demand for plant shows little sign of slackening, though the policy of capital expenditure cuts may have some effect on this in the immediate future. The Company's greatest immediate anxieties are the delays caused by the shortage of steel and the scarcity of labour for certain types of work. Apart from these difficulties and the gloomy overall national and world picture, the Directors foresee a period of continuing prosperity.

GAS UNDERTAKINGS' RESULTS

Maryborough Gas and Coke Company (Queensland).—Gas sales show a considerable increase over 1946, but expenditure has risen steeply. The supply of appliances is still very far short of the demand, and no main pipe has been received during the past two years; these factors, says the Directors' report, are greatly retarding the Company's progress. A final dividend of 5% has been declared, leaving £330 to be carried forward, compared with £362 brought in from the previous year.

Dunstable Gas and Water Company.—The taxed profit on the gas undertaking for 1947 was £2,745 against £5,147 for the previous year. After taking credit for proportion of taxation reserve no longer required £700, and transfer from reserve fund, £781, the carry-forward is £4,862, the same as for the previous year. Final dividends making the full standard rates for the year on Preference stock and all three classes of Ordinary stock will be recommended at the annual meeting on April 27.

Colonial Gas Association.—A cable has been received from Melbourne stating that at a recent meeting of the Directors, interim dividends were declared for the half-year ended Dec. 31, at the rate of 8% per annum (Australian currency), less tax, on the Preference shares, and at the rate of 5% per annum (Australian currency), less tax, on the Ordinary shares, and less deduction for rate of exchange. The dividends were payable in Melbourne on April 3, but it will not be possible, owing to the uncertainty as to the rate of exchange ruling at the date of declaration of dividend, for shareholders on the English register to be paid until about the end of the month.

Hornsey Gas Company.—The revenue account shows an increase of £18,000 in the cost of gas manufacture, and the cost of coal was higher by 106% on the average price paid in 1938. Gas sales in 1947 were 2½% higher than in 1946, and 11% more than in 1938. Revenue from gas sales increased by £5,700, and the income from the sale of coke and other by-products shows an increase of £4,000. The gross profit carried to net revenue account was £22,567 compared with £38,672 for 1946. Final dividends making £6 9s. 6d.% for the year on the 5% stock, and 5% on the 3½% stock leave a balance of £17,513 to be carried forward, against £14,259 brought in.

Bath Gas Company.—A final dividend of 2½%, making 5% for the year, was declared at the annual meeting on Mar. 17. The accounts showed an income of £397,366 from the sale of gas, compared with £368,714 for the previous year, and a balance carried to profit and loss account for £33,053 against £34,285. The Directors' report stated that following an agreement with the shareholders of the Shepton Mallet Gas Company the whole of the issued Ordinary shares of that Company were acquired in December, this being achieved by the issue of £11,050 Ordinary stock. Agreements have been made to supply gas in bulk to the gas undertakings at Warminster and Westbury. The laying of the necessary main to Warminster has been completed, and the bulk supply is now being made. The laying of the main to Westbury is nearing completion.

Lea Bridge District Gas Company.—Receipts from the sale of gas in 1947 were up by £41,013 compared with the previous year, and the quantity of gas sold was 9.8% above that for 1946, and was a record for the Company. Sales to domestic consumers through ordinary meters, prepayment meters, and for industrial purposes, were almost equal. The sale of residuals brought in £26,373 more than in 1946. As the result of the year's working, £77,076 has been carried to net revenue account, the net profit for the year being £15,687. The usual Preference dividends have been declared, together with 7½% on the Consolidated Ordinary stock, and £3,310 has been allotted to co-partnership, leaving a carry-forward of £30,911, against £32,552 brought in.

Rushden District Gas Company.—Manufacture of gas reached a record of 335 million cu.ft. last year. The Directors, in their report to the annual meeting, expressed satisfaction with the new carbonization plant. Distribution to certain parts of Raunds had been improved by the laying of larger mains, and the Company had kept ahead of progress on all housing estates. Despite rising costs of materials and labour, no alteration in the price of gas was made during the year. The operating profit for the year was £11,254 and dividends for the second half of the year were declared at the same rates as for the first half. Revenue totalling £73,613 included £17,163 from ordinary meters, £48,815 from prepayment meters, and £1,129 from public lighting, less discounts. A profit of £2,470 was made on fittings and the sale of appliances.

Eastbourne Gas Company.—Gas sales at 3,921,106 therms in 1947 constituted an all-time record and showed an increase of 8¾% over the previous year. Prior to 1947 the record sale of gas from the Eastbourne works was 3,281,000 therms in 1929. This has been exceeded by 194,400 therms, or 6%; from the Seaford works the previous best was 381,005 therms in 1946, exceeded last year by 65,700 therms, or 17%. Gross profit was £36,942 against £44,408 for 1946. Final dividends making, for the year, the standard rates on the Preference stocks, 5% on "A" Ordinary stock, and 3½% on "B" Ordinary stock, leave a balance of £4,311, which is applied in further reduction of the net revenue deficiency suspense account, reducing the loss carried forward from £12,786 to £8,475. During the past three years consumers have purchased 1,528 cookers, 2,016 fires and radiators, and 1,765 water heaters and wash coppers.

PUBLICATIONS RECEIVED

A new illustrated catalogue has been published by Falk, Stadelmann & Co., Ltd., describing their range of gas glassware. Some 60 styles of globes are included, ranging from small domestic types to bowls and globes for street lighting lanterns.

* * *

The use of mobile cranes on gas-works is becoming increasingly common, as these machines can carry out many difficult types of material handling jobs with speed and accuracy. Five types of mobile crane are described in a new leaflet distributed by Steels Engineering Products, Ltd., dealing with the well-known Coles cranes. Three of these are electrically operated for all purposes, including travelling, and of most compact design, the others being mounted on standard lorry chassis. Hoisting performances range from 20 cwt. at 25 ft. per minute to 6 tons at 18 ft. per minute, and total unladen weights from 4½ tons to 16 tons. Features of these cranes include slewing throughout the 360°, lift-off steel panelling all round the superstructure, and maximum visibility for the operator.

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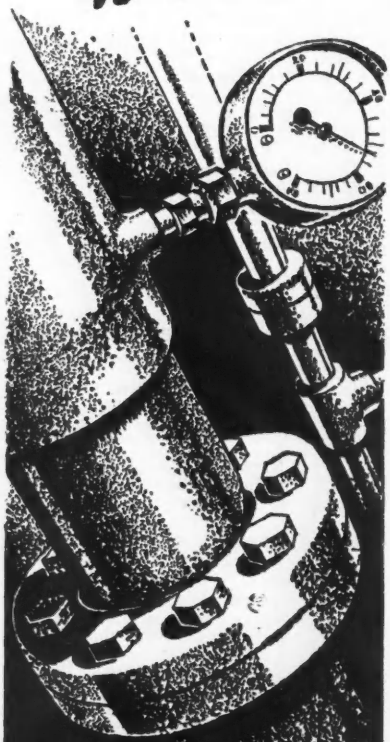

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From Goodenough Contractors' Machinery, Ltd., has come a leaflet describing the range of Atalanta pumps. The centrifugal models range from 1 in. to 3 in. sizes and there is also a 1 in. high pressure pump. The pumps are made in non-corrosive light alloy, and in special cases can be anodized if acids or chemicals are used. All models are self-priming and are fitted with a stainless steel seal which needs no lubrication or manual attention during operation. The impellers are of the four vane open type, manufactured in gun metal, webbed for rigidity.

* * *

Concrete in Gas-works as a title is self-explanatory, but the many applications of concrete in the modern gas-works requires considerable explanation. The book of this name is published by the Cement and Concrete Association and is in the form of a survey of the process of gas manufacture from the supply of coal at the wharfside to the gas stored in the holder. The numerous illustrations are of actual installations and are of a very high quality. Production generally is above average and the book is to be recommended to all connected with the manufacturing side of the Industry.

* * *

A new publication, entitled *Factory Planning and Installation*, has been produced by Thos. W. Ward, Ltd. The story is a novel one and extremely interesting, describing as it does the formation of what came to be known as Wards' F.P.I. department—a team of skilled men whose job it was to dismantle, remove, and re-install machinery of all types. The service was born in the war years when it became necessary to move whole factories to avoid enemy bombing. The war ended, but the F.P.I. department remained and is available to-day. The booklet under review describes in word and picture some of the more interesting removal jobs handled during that critical time, many of them tasks of astonishing magnitude. One example will suffice to indicate the speed and organization employed: During one week-end an entire factory was moved, including some 400 tons of machines and materials, and was in production again on the Monday morning.

An attractively produced catalogue has been received from the Hygienic Stove Co., Ltd., describing their very considerable range of gas-heated catering equipment. In addition to tea urns and frying ranges of various sizes, two distinct series of hot cupboards are shown, both fitted with thermostatic control. The "Windsor" food and vegetable steamer is made in five sizes, is of the non-pressure type, and can boast thermostatic gas control, automatic water supply, and a stainless steel steaming chamber. Also made in five sizes is the "Universal" vegetable and meat boiling pan, but of particular interest is the "Dual" boiling pan which consists of an outer pan of cast iron, and a removable tinned copper inner pan, the space between the two containers forming a water jacket.

GAS PRODUCTS PRICES

April 3

London.—There are no changes to report in the prices of Coal Tar products.

Provinces.—Average prices for gas-works products this week are: Pitch, 100s. per ton; toluole, naked, North, 90's, 2s. 4d. to 2s. 6¾d. per gall.; pure, 3s. 2¼d. Prices for carbolic acid 60's anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil are controlled by Government Orders. Prices for road tar are increased by one penny per gall. by S. R. & O., 1947, 177.

Scotland.—Export requirements can only be partially satisfied.

Refined tar.* Yield to the distiller is 6d. per gall. ex works, naked. Creosote oil. Timber preserving quality,* 5½d. to 6½d. per gall.; hydrogenation oil,* 5⅝d. per gall.; low gravity or virgin oil,† 7½d. to 7¾d. per gall.; benzole absorbing oil, 6½d. to 8d. per gall. Refined cresylic acid is 3s. 6d. to 4s. 6d. per gall. ex works, naked, according to quality. Crude naphtha,† 8d. to 10d. per gall. Solvent naphtha.* Basic maximum prices delivered in bulk, 90/160 grade 2s. 10d. per gall. and 90/190 heavy naphtha, unrectified, 2s. 0½d. per gall.; rectified, 2s. 4d. per gall. Pyridine,† 901/60 grade 15s. per gall., and 90/140 grade 17s. per gall.

* Price controlled. † Uncontrolled.

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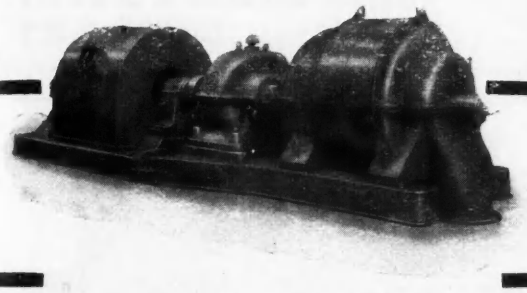

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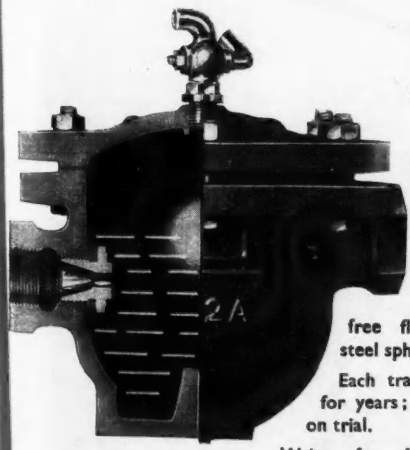

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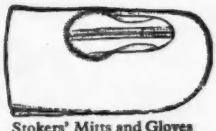

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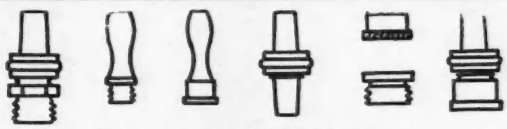

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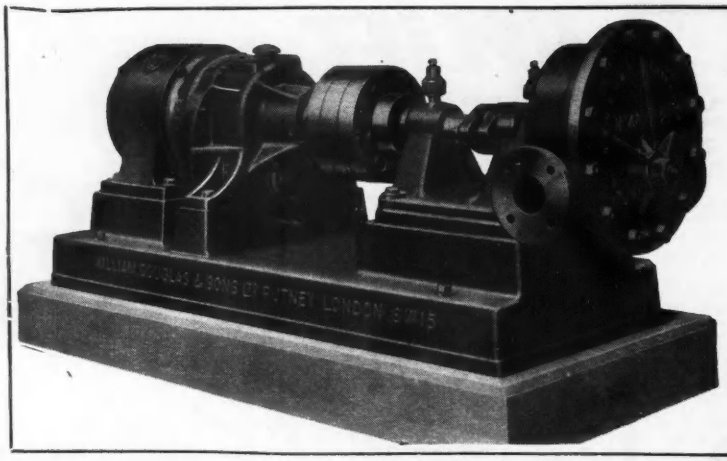

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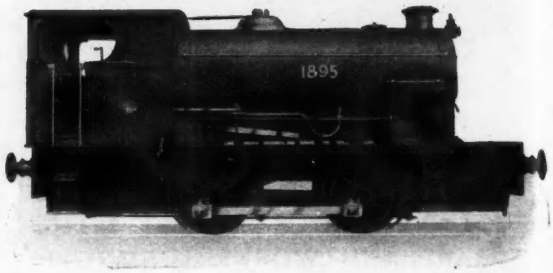

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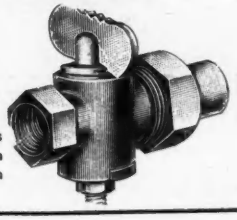

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SMALL single truckloads and larger quantities of good ROUGH BREEZE from any Gas-Works, large or small, in the United Kingdom required by merchants paying own Railway Tolls. Cash price and particulars to No. 9378, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C.4.

PLANT FOR SALE & WANTED

GAS LAMP STANDARDS (54) for sale (31 fluted C.I. 9 ft. 6 in. high, 23 steel pillars 11 ft. high), complete with lamps (38 two-light, 16 four-light) and clocks. Further particulars from COUNTY CLERK, County Offices, Rothesay, Bute.

WANTED. GAS CONDENSER, vertical water tube, capacity 750,000 to 1.0 0,000 cu.ft. gas per day, complete with connexions if possible.
Full particulars, including age and condition, should be forwarded to the ENGINEER AND MANAGER, Pembroke District Gas Company, Pembroke Dock.

PHONE 98 STAINES.

AIR RECEIVER, 18 ft. 6 in. by 4 ft., 100 lb. Broom & Wade TWIN COMPRESSOR, Type D21.
Cylindrical ENCLOSED TANK, 30 ft. by 7 ft. 34 KW. STEAM GENERATING SET, 220 volts D.C.
Robey H.S. VERTICAL STEAM ENGINE, 9 in. by 7 in.
LANCASHIRE BOILER, 24 ft. by 8 ft., 120 lb.
Weir type VERTICAL FEED PUMP, 2,000 g.p.h.
HARRY H. GARDAM & Co., LTD., Staines.

FOR SALE.

MARINE BOILERS.
Self contained, three furnace Marine Boiler, 13 ft. 6 in. diameter by 10 ft. 6 in. long, 180 lb. per sq. in. working pressure.

LANCASHIRE BOILERS.
30 ft. by 8 ft. 6 in. two furnace Lancashire Boiler, 150 lb. per sq. in. working pressure, complete with "Bennis" induced draught twin gravity feed, coking type automatic stoker, with self cleaning fire grate. Fifteen-ton bunkers also available if desired.
Three off 30 ft. by 8 ft. two furnace Lancashire Boilers, 150 lb. per sq. in. working pressure, complete with "Bennis" induced draught, twin gravity feed, coking type automatic stoker, with self cleaning fire grate. Fifteen-ton bunkers also available if desired.
30 ft. by 7 ft. two furnace Lancashire Boiler, 140 lb. per sq. in. working pressure.

PORTABLE LOCO TYPE BOILERS.
16 N.H.P., complete with engine by Ransomes, Sims & Jefferies, Ltd., 120 lb. per sq. in working pressure. Approx. 1,600 lb. evaporation.
12 N.H.P., complete with engine by Ransomes, Sims & Jefferies, Ltd., 120 lb. per sq. in. working pressure. Approx. 1,200 lb. evaporation.
12 N.H.P., complete with engine by Ruston, 150 lb. per sq. in. working pressure. 990 lb. evaporation.
12 N.H.P., complete with engine by Marshall, Sons & Co., 100 lb. per sq. in. working pressure. 1,100 1,200 lb. evaporation.

VERTICAL MULTITUBULAR BOILERS.
Cochran Vertical Boiler, 14 ft. by 6 ft. 6 in. by 150 lb. per sq. in. working pressure. Evaporation approx. 4,000 lb. Thermostatically controlled and complete with Clyde Automatic stoker.
Cochran Vertical Boiler, 7 ft. 6 in. by 3 ft. 3 in. Evaporation approx. 340 lb.

AUTOMATIC STOKERS.
Six off "Combustioneer" Automatic Stokers by Mirrlees Bickerton & Day, Ltd., powered by 1 h.p. motors suitable for 400 volt, 3-phase, 50 cycles supply.
JAMES N. CONNELL, Phoenix and Clifton Works, Coatbridge, Scotland. Phone: Coatbridge 1121 (5 lines).

CONTRACTS OPEN

COUNTY BOROUGH OF WALSALL
(GAS DEPARTMENT.)

TENDERS are invited from Contractors experienced in the work of CLEANING AND PAINTING gasholders, purifiers, telpher track and other structures and plant.
Specification, together with general conditions of contract and form of tender, may be obtained on application to the undersigned.
Sealed tenders, addressed to the Town Clerk, Town Clerk's Office, Council House, Walsall, and endorsed "Tender for Painting Plant and Structures, Walsall Gas Department," must be delivered not later than 11 a.m., Monday, May 3, 1948.
The Gas Committee does not bind itself to accept the lowest or any tender.

A. ALLEN,
General Manager and Chief Engineer.

Pleck Gas-works,
Walsall, Staffs.
April 3, 1948.

CITY OF MANCHESTER
(GAS DEPARTMENT.)

THE Gas Committee invites tenders for the WORK AND MATERIALS required in REPAIRING the Crowns and Side Sheeting on the Inner Lifts of Nos. 6 and 7 Gasholders at Rochdale Road Works, Newtown Gasholder Station.
Specification, general conditions of contract and form of tender may be obtained on application to the Commercial Manager and Secretary, Gas Department, Town Hall, Manchester, 2.
Sealed tenders in the envelope provided addressed to the Chairman of the Gas Committee and endorsed "Repairing Gasholders" must be delivered at the Gas Office, Town Hall, Manchester, 2, not later than 5 p.m., Wednesday, April 14, 1948.
The Committee does not bind itself to accept the lowest or any tender.

PHILIP B. DINGLE,
Town Clerk.

Town Hall,
Manchester, 2.
March, 1948.

BOROUGH OF REDCAR
(GAS DEPARTMENT.)
CARBURETTED WATER GAS PLANT.

TENDERS are invited for the supply, delivery and erection at the Corporation Gas-works, West Dyke Road, Redcar, of:—
1,000,000 cu.ft. per day mechanically operated CARBURETTED WATER GAS PLANT, complete with Jacket Boiler for the Generator, Gas Condenser and Water Cooling and Circulating Plant, Coke Handling equipment, together with a steel framed Building to house the Plant.
Further particulars, specification, general conditions of Contract and Form of Tender may be obtained from H. P. Allison, M.Inst.Gas E., Engineer and Manager, Gas-works, West Dyke Road, Redcar.
The Borough Council does not bind itself to accept the lowest or any tender.
Tenders, in plain sealed envelopes, endorsed "C.W.G. Plant," should be delivered to the undersigned at the Municipal Buildings, Redcar, by first post on Friday, April 23, 1948.

H. CALDWELL,
Town Clerk.

Municipal Buildings,
Redcar.
March 31, 1948.

(Classified advertisements continued on Supplement 6)

BOROUGH OF DARWEN

(GAS DEPARTMENT.)

ELECTROSTATIC DETARRER.

TENDERS are invited for the supply, delivery and erection of an ELECTROSTATIC DETARRER, complete with valves and connexions and having a capacity of 2½ million cu.ft. of gas per day.

Full particulars may be obtained on application to the Engineer and General Manager, Corporation Gas-works, Charles Street, Darwen.

Tenders bearing no external indication of the identity of the sender and endorsed "Tender for Electrostatic Detarrer" must be delivered to the undersigned not later than the first post on Monday, May 10, 1948.

CHARLES CCUTTS BYERS,
Town Clerk.

Town Clerk's Office,
Darwen.
April 1, 1948.

NEW HUNSTANTON URBAN DISTRICT COUNCIL

(GAS DEPARTMENT.)

TENDERS are invited for:

(*a*) The supply and erection of one 50,000 cu.ft. per hour BOOSTER, electrically driven, together with necessary 8 in. connexions, by-pass and diaphragm outlet pressure regulator.

(*b*) The supply of 15 AREA GOVERNORS and 100 SERVICE GOVERNORS of various sizes.

(*c*) The supply of 300 lineal yards of 8 in. C1 PIPE with flexible joints and connecting specials to existing mains.

(*d*) The installation of (*b*) and (*c*) together with the excavation on existing mains at convenient points, cutting out short lengths of pipe to isolate sections. Fix and disconnect riders where necessary to maintain supply of gas, make good and replace previously removed pipes, reinstate excavations with existing materials. The length of mains to be scraped are as follows:

800 lineal yards of 8 in. C1 main.
10 lineal yards of 6 in. C1 main.
10 lineal yards of 4 in. C1 main.
10 lineal yards of 3 in. C1 main.

Further details of specifications, requirements and conditions of contract may be obtained on application from the Gas Engineer and Manager, Council Offices, Hunstanton, Norfolk.

Sealed tenders, stating period of delivery of materials and endorsed "Gas Distribution Scheme" must be received by the undersigned not later than the first post April 30, 1948.

The Council do not bind themselves to accept the lowest or any tender.

OSCAR S. WATKINSON,
Clerk of the Council.

Council Offices,
Hunstanton,
Norfolk.
April 3, 1948.

APPOINTMENTS VACANT

None of the vacancies in these columns relates to a man between the ages of 18 and 50, inclusive, or a woman between the ages of 18 and 40, inclusive, unless he or she is excepted from the provisions of the Control of Engagement Order, 1947, or the vacancy is for employment excepted from the provisions of that Order.

YOUNG CHEMIST or CHEMICAL ENGINEER required for the development of Industrial and Domestic Gas Appliances. Good prospects. Salary according to age and experience. Apply RADIANT HEATING, LTD., Radiant Works, Barnsbury Park, London, N.1.

ASSISTANT CHEMISTS required by old- established firm developing new processes for the manufacture of synthetic organic chemicals at their new works in the Midlands. Excellent opportunities are offered for young men of drive and ability. Experience in gas analytical work and a knowledge of manufacture of synthetic organic chemicals desirable but not essential. Salary £350-£450 per annum. Apply in confidence, giving full particulars of qualifications and experience, to No. 9722, "GAS JOURNAL," 11, Bolt Court, Fleet Street, London, E.C.4.

DESIGNERS AND JUNIOR DRAUGHTSMEN required, experienced in design and detail of carbonizing plants, refractories, mechanical and steelwork details, &c. Permanent positions with good salaries to capable men. Five-day week.

Apply to GAS CHAMBERS & COKE OVENS, LTD., Artillery House, Westminster, S.W.1.

PRESTON GAS COMPANY

HOME SERVICE ADVISER AND DEMONSTRATOR.

APPLICATIONS are invited for the above appointment, at a salary of £350 per annum.

Applicants must be capable of conducting demonstrations in cookery, laundry and other home services and should possess a recognized diploma in domestic science.

Applications, stating age and experience, with *copies* of recent Testimonials, to be addressed to the MANAGING DIRECTOR not later than April 30, 1948.

Fishergate,
Preston.

CITY AND ROYAL BURGH OF EDINBURGH

(GAS DEPARTMENT.)

APPLICATIONS are invited for the position of ASSISTANT SALES SUPERINTENDENT.

Salary scale £490, rising to £550 per annum, plus current annual war bonus of £60.

Applicants for this post should be in possession of the Institution of Gas Engineers Higher Grade Certificate in Gas Supply or equivalent qualification, and have good experience of showroom and district sales and a sound knowledge of sales office procedure.

Applications, giving fullest details of education, training and experience, together with names of not more than three persons from whom references could be obtained, should be addressed to DUNCAN D. MELVIN, Esq., Engineer and Manager, Corporation Gas Department, 15, Calton Hill, Edinburgh, 1, not later than Monday, April 19, 1948.

SPALDING URBAN DISTRICT COUNCIL

(GAS DEPARTMENT.)

TECHNICAL ASSISTANT.

APPLICATIONS are invited for the above appointment at a salary on Miscellaneous Scale I of the National Scale of Salaries (£315—£15—£360). Candidates should have experience in vertical retort house practice, laboratory work and the control of the production of gas and its by-products. The appointment is subject to the provisions of the Local Government Superannuation Scheme and the successful candidate will be required to pass a medical examination. Applications, stating age, experience and qualifications, accompanied by two recent Testimonials, must reach the undersigned not later than April 24, 1948.

R. C. ARNOLD,
Engineer and Manager.

Gas Department,
Albion Street,
Spalding, Lincs.

BOROUGH OF STRATFORD-UPON-AVON

(GAS DEPARTMENT.)

COOKERY DEMONSTRATOR AND SHOWROOM ASSISTANT.

APPLICATIONS are invited for the above position. Applicants should be capable of conducting demonstrations and advising consumers in the use and care of gas appliances. The salary will be in accordance with the General Division (Female) of the National Scale of Salaries, the maximum of £308 per annum (including bonus) being reached at the age of 30 years.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications, details of experience and *copies* of Testimonials, should be addressed to the undersigned and received not later than April 23, 1948.

D. K. GREEN,
Engineer and Manager.

Gas-works,
Birmingham Road,
Stratford-upon-Avon.

APPLICATIONS are invited from persons under 40 years of age with experience in gas accountancy, for the post of ASSISTANT SECRETARY. Salary will be in accordance with qualifications and experience. Apply, stating age, qualifications, experience and salary expected, to CRADLEY HEATH GAS COMPANY, Cradley Heath, Staffs.

STRETFORD AND DISTRICT GAS BOARD

APPLICATIONS are invited for the position of DEPUTY WORKS GENERAL FOREMAN. Appointment designated in Grade A.P.T. II with commencing salary not less than £420 per annum according to experience. A good house is available at a reasonable rent.

Applicants should not exceed 45 years of age, have good all round gas-works experience, especially of horizontal retorts, be good organizers and strict disciplinarians.

Applications, together with *copies* of two recent Testimonials, are to be delivered to the undersigned not later than April 22, 1948.

JOHN GRAYSTON,
Engineer, General Manager and Clerk.

Gas-works,
Longford Road,
Stretford, Manchester.

THE WATFORD AND ST. ALBANS GAS COMPANY

APPLICATIONS are invited for the following appointments at the St. Albans Works of the Company.

ASSISTANT WORKS ENGINEER.

Applicants must be Corporate Members of the Institution of Gas Engineers, capable of assisting the Works Engineer in all his duties and in his absence of assuming control. The post offers scope to a young man of ability. The works is producing gas at the rate of 2,000 million cu.ft. per annum and is being rapidly expanded.

The salary offered is not less than £700 per annum, and a house within easy reach of the works will be provided, rent and rates free.

SENIOR WORKS CHEMIST.

Candidates should possess a professional qualification and have had works experience, preferably in the Gas Industry.

The salary offered is not less than £500 per annum.

Applications should be addressed to the undersigned and reach him not later than April 22.

T. C. BATTERSBY,
General Manager and Chief Engineer.

Radiant House,
Clarendon Road, Watford.

TREDEGAR URBAN DISTRICT COUNCIL

DEPUTY GAS ENGINEER AND MANAGER.

APPLICATIONS are invited for the position of DEPUTY GAS ENGINEER AND MANAGER.

Candidates should have practical experience in manufacture and distribution and be thoroughly conversant with the control and operation of Woodall-Duckham upward-heated continuous vertical retorts.

The appointment is subject to the Conditions and Salary Scales of the National Joint Council, the salary being in accordance with Grade III of the A.P. & T. Division.

The appointment will be terminable by one month's notice on either side and will be subject to the provisions of the Local Government Officers' Superannuation Act, 1937, the successful applicant (if a new entrant to the Council's service) will be required to pass a medical examination.

The canvassing of members of the Council, either directly or indirectly, will be a disqualification, and applicants must state whether to their knowledge they are related to any member of the Council or any officer of the Council.

No printed form of application is being used.

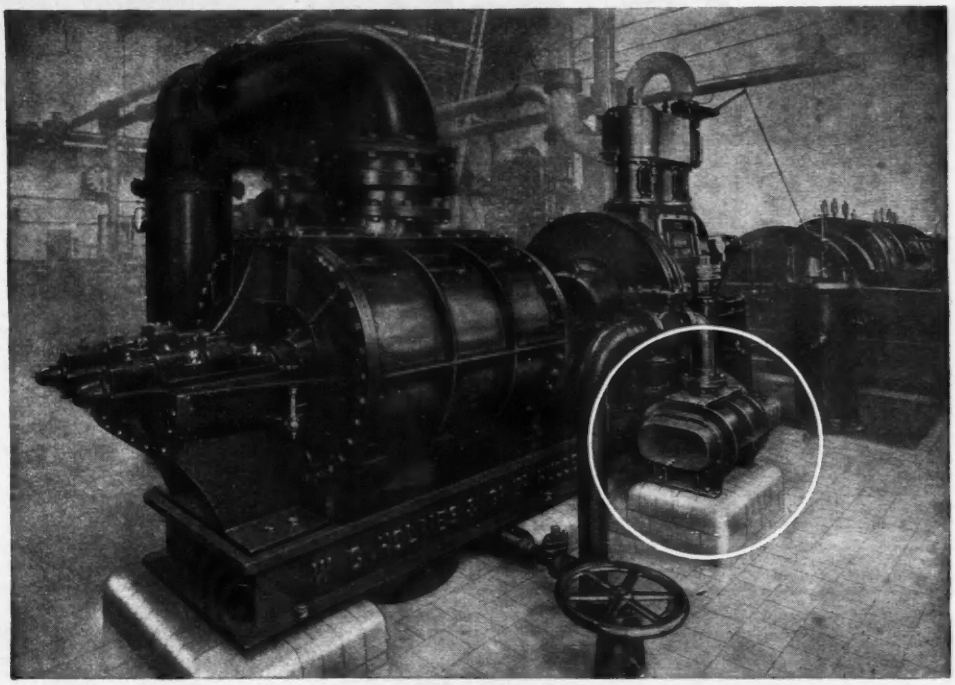
Applications, stating age, qualifications, present and previous appointments (with dates and salaries) and giving full details of experience, together with *copies* of three recent Testimonials, are to be received by the Clerk of the Council, Bedwellty House, Tredegar, Mon., not later than noon on Monday, April 19, 1948.

O IVER LLEWELLYN,
Clerk of the Council.

Bedwellty House,
Tredegar, Mon.
March 26, 1948.

Get in on the Under Belly of RUST (Engineers' Enemy No. 1.)
Years of Wear instead of Weeks
GRANT & WEST, LTD.
'PHONE NORTH 2160
Steel Wires, Ropes & Cables running in and out of Water, Gas, Sulphurous Fumes, etc. will never RUST if treated with
ROPRES
IT KILLS RUST
STAYS on every STRAND
RUST KILLS ROPES.—but ROPRES rope preservative KILLS RUST. Use ROPRES.
Try a Tin on our Guarantee
3, Furlong Road, London, N.7.
'GRAMS: "SELEKJOINA, HOLWAY, LONDON"

REVIVIFICATION



By courtesy of H. J. Risby, Esq., General Manager

BLOWERS

REVIVIFICATION demands a positive blower of the highest efficiency, in view of the variable loading.

The immediate answer is the Holmes-Connersville Blower. A proportionate air to gas ratio is obtained when driven from the exhauster shaft as shown in the above installation for the County Borough of Southport Gas Department.

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HOLMES
HUDDERSFIELD

Telephone Nos.
Huddersfield 5280-6 London Victoria 9971-3 Birmingham Midland 6830.

W. C. HOLMES & CO. LTD. · HUDDERSFIELD · LONDON · BIRMINGHAM

C286

If it's industrial heating it can be done better with gas if—

"Keith-Blackman"
INDUSTRIAL GAS HEATING EQUIPMENT

is employed.

"KEITH-BLACKMAN" Industrial Gas Heating Equipment includes: High and Low Pressure Gas Injectors, Burners and Nozzles for almost every industrial heating process; Brazing Blowpipes; Soldering Irons; Soldering Stoves; Air and Gas Mixture Controllers; Thermostat Temperature Controllers; Back-pressure Valves; Meter Protection Valves; Pressure Governors; Gas Compressors; Air Compressors, and Safety Shut-off Valves.

The illustration shows 7 "Keith-Blackman" Air and Gas Mixture Controllers and a "Keith-Blackman" Air Blast Fan, part of industrial heating equipment applied to gum running furnaces.

Booklet No. G57 sent on request.

When it is an industrial heating problem always consult

KEITH BLACKMAN LTD., MILL MEAD ROAD, LONDON, N. 17. T.N.: TOTTENHAM 4522. T.A.: KEITHBLAC, PHONE, LONDON

FOR AUTOMATIC IGNITION OF DOMESTIC COOKERS, FIRES, ETC. USE

METOLITE REGD

Lighter Flints

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Type 'P'

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Supplies of All types now available to Public Utilities

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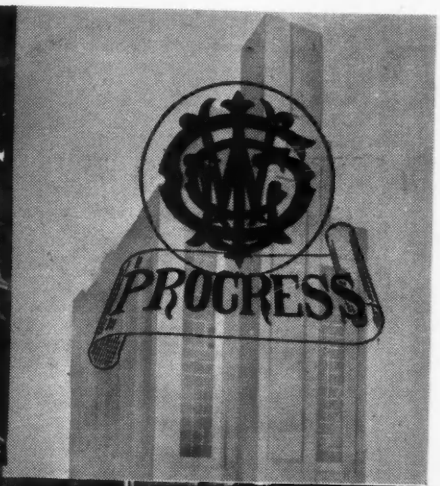
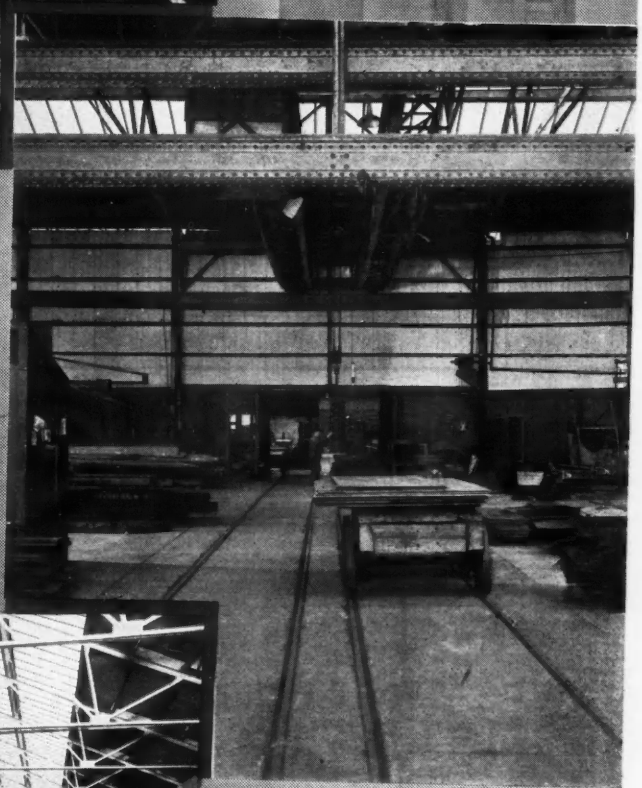
PHONE Tonbridge 753 & 970 TONBRIDGE, KENT (CONTRACTORS TO H.M. GOVERNMENT.) GRAMS: "Britflint, Tonbridge"

Printed by Straker Brothers Ltd., E.C.2, for WALTER KING LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C.4.—Wednesday, April 7, 1948





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GLOVER-WEST VERTICAL RETORTS

is fabricated in our own shops at

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MANCHESTER

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Miles Platting

MANCHESTER 10

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Telegrams: Stoker, Manchester

London Office:

COLUMBIA HOUSE, ALDWYCH, W.C.2

Telephone: HOLborn 4168-9

Telegrams: Wesgasco, Estrand

A

ASCOT gas water heaters are enlisted in the Nation's service in an all-out effort to make fuel supplies go round. Read what the British Gas Council says in its report to the Chancellor of the Exchequer :—

" In the interests of fuel economy, hot water should be provided by the most efficient means available, namely, the water heater which has been developed expressly for the purpose and none other."

Ascot heaters save fuel because they give hot water **when** and **where** it is needed.

A MILLION ASCOT

Gas Water Heaters are helping

in the battle to save fuel

ASCOT

ASCOT GAS WATER HEATERS LIMITED · 43 PARK STREET · LONDON W.1 · GRO 4491